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TOUGH TIMES AHEAD

Columnists Pimm Fox and Bill Laberis talk about sailing difficult economic seas. Pages 26 and 31



CIO FOR RENT

Hiring a CIO is time-consuming. In the meantime, try renting one. Page 64

EDI, XML OR BOTH?

Our Field Report shows how new tools are helping to ease the migration and integration process for companies. Page 54

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

JANUARY 8, 2001 • VOL. 35 • NO. 2 • $5 COPY



PHOTO: ROBIN/SABA

SAM BAHOUR, a Palestinian IT consultant, says he hopes the Internet can bridge the gap between Palestinians and Israelis.

UNDER SIEGE

RUNNING IT PROJECTS IS TOUGH ENOUGH, but IT professionals in the Middle East face the extra challenge of working in a war zone, report Mark Hall and Pimm Fox. Since Israeli-Palestinian violence erupted three months ago, just getting to work — past the riots and border checkpoints — has been difficult. Then there are the telecom outages and delays in getting equipment.

Story begins on page 20.

CIOs CLAIM NETWORKS ARE SECURE

But some suspect the optimism in survey — if honest — is overstated if not misguided

BY DAN VERTON

Despite estimates that place corporate financial losses from cybercrimes in the billions of dollars, 91% of 1,400 CIOs polled in a recent survey said they're confident their companies' networks are secure.

Yeah, right.

"What else could they say?" asked Winn Schwartau, an author of books on information security and president of Interpact Inc., a security consulting firm in Seminole, Fla. "They have to tell their bosses they are secure to keep their jobs. I think this survey was a crock."

Ron Turner, the Navy's deputy CIO for infrastructure, systems and technology, said he found the results surprising. Even with multilayered cyberdefense systems in place, companies must contend with the fact that cybercrimes are on the rise throughout the world, said Turner.

"Even with all that I know we have in [the Defense Department], I don't share their optimism," he said.

The poll of CIOs in eight in-

Security, page 69

DATA CULLING CREATES CONTROVERSY

CRM 'culture clash' predicted for this year

BY MARC L. SONGINI

David Spinelli doesn't want to know that you caught a cheap flight to the Bahamas last March. But he does want to know your birthday.

For Spinelli, general manager of Lowell, Mass.-based Action6, a travel-related services firm, it's not the transactional data that matters most when it comes to cross-selling to customers.

"We need [the travel agents] to collect things about demographics — if they have a birthday coming up, and if they prefer to ski," said Spinelli. "This data is extremely valuable."

Deciding what information is collected and how it's used is going to be a thorny issue for companies this year as many embark on customer relationship management projects, predicted Erin Kinikin, an analyst at Giga Information Group Inc. in Santa Clara, Calif.

Giga's new CRM forecast sees infighting among corporate departments this year over who owns the customer — and the knowledge about the customer.

"There's going to be a huge culture clash," Kinikin said.

Translating this data into repeat business isn't going to be

Data, page 69

NEWSPAPER

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STARBUCKS TAKES WIRELESS LEAP

Goal is to increase postbreakfast business

BY BOB BREWIN

Starbucks Corp. plans to serve up high-speed wireless LAN access to its customers in all 3,000 of its North American outlets, betting that access to the technology will drive traffic into its coffee shops during off-peak postbreakfast hours.

Giving customers the ability to access a 10M bit/sec. wireless LAN while enjoying a cup of coffee on a comfortable couch "will increase traffic outside the morning hours," said Darren Huston, senior vice president for new ventures at Seattle-based Starbucks. He noted that the company currently does 80% of its business in the morning.

Starbucks customers pushed the company to provide some type of access, Huston said, and after studying several

Starbucks, page 16

AT A GLANCE

LANs With Your Latte

With its wireless LAN deal, Starbucks:

- Plans to install 10M bit/sec. wireless LANs at all 3,000 North American outlets
- Believes it will drive customer traffic in off-peak hours and enhance brand image
- Expects road warriors as early users, with service supporting VPNs
- Will sell the service for fees ranging from $2.50 for 15 minutes to $59.95 per month for unlimited access

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GOOD MORNING



Once again, taday has arrived. And it brings with it the same meetings, the same prablems, and, in many cases, the same salutians. Unfartunately, many af thase same salutians aren't working. Because business has been transformed by the little letter e. And the technalagy that was ance the damain of twentysamethings with a website and a warehause in their garage is naw an integral part af every business. Fartunately, however, the same principles that made for good management before still make gaad eBusiness sense. Of caurse, that's a lat mare difficult naw that yaur business isn't cantained by faur walls and needs ta be accessible anywhere, anytime, far anyane. That's why it's more important than ever to have the very best software. Software that manages yaur business processes – integrating all parts of your company, including suppliers and partners, to make sure that they're warking tagether seamlessly. Saftware that manages infarmation – storing, accessing, and utilizing the vast wealth af knawledge that yau cantinually gather about yourself and your customers. Software that manages your infrastructure – maintaining and securing yaur assets while letting you see the big picture to ensure that everything keeps running smoothly. There's no doubt about it. Things have changed. But that just means there will be new solutions to the old problems. And we think that's a change far the better.

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OH, WILL YOU BEHAVE?

The best way to put the brakes to constant turnover in your IT department is to hire better in the first place. Smart companies are turning to the behavioral interview, which reveals patterns of likely behavior under different circumstances, to better evaluate job candidates. It's a critical step in the hiring process to make sure a potential employee will be a good fit in the company culture. Page 42

KEEPING THE CUSTOMERS SATISFIED



Online retailers like Uniglobe.com's Mike Dauberman are turning to text chat, intelligent FAQs, integrated call centers and voice over IP to make sales. Page 58

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JANUARY 8, 2001

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6 BUSH MAKES NICE with high tecb leaders after filling his Cabinet with executives from Old Economy firms.

7 THE SEARCH FOR new jobs gets tougher as dot-coms shed more staff to slash costs.

7 POWER OUTAGES in the Midwest bring some IT operations to their knees, revealing new business vulnerabilities.

6 ETOYS LAYS OFF 70% of its workers and shuts its European operations.

12 DOT-COMS PASS on this year's Super Bowl telecast, buying just 10% of the ads for the event after buying 40% of the ads last year.

12 EBAY SHUTS DOWN for 11 hours due to a hardware failure.

12 PRESSURE TO RETIRE punch-card voting machines across the U.S. drives a technology race for a better system.

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44 GIRLS STILL SHY AWAY from technology and business, according to a recent study. But many of them have the right skills and goals to become successful IT leaders, say experts.

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QUICKSTUDY

60 RELATIONAL DATABASES hold important information for most companies.

ONLINE



In his latest column in the **E-Commerce Community,** West Coast bureau chief **Pimm Fox** asks the question: When the market tells the truth, will tech companies see the reality? *www.computerworld.com/ecommerce*

Also on the **E-Commerce** page, author **Cathy Curley** delivers excerpts from her new book, *A Pocket Manager's Guide to Knowledge Management.* Curley, a senior vice president at Communispace in Cambridge, Mass., takes us through "10 Myths about Knowledge Management."

In the **Windows 2000/OS Community,** author and *The New York Times* technology columnist **David Pogue** discusses the "missing manual" for Windows 2000, including some quick tips to make the user's life a lot easier and more productive. *www.computerworld.com/windows2000*

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26 MARK HALL ponders the future of the Macintosh in corporations as the Macworld Expo convenes in San Francisco this week.

26 PIMM FOX writes that in the face of tough times, IT managers must prove they can help generate profits.

27 ALLAN E. ALTER states that year-in-review artieles should provide more advice for the future rather than summarizing the past.

31 JOHN GANTZ says forget the current state of the dot-coms: Internet commerce will continue to boom.

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38 PAUL A. STRASSMANN shows how fuzzy math affects IT budget decisions in Washington.

70 FRANK HAYES says the dot-coms' demise isn't a threat to your firm. Your direct competitors are the real threat.

Privacy, Net Tax High On Congress' Agenda

But industry still divided on whether government rules will bolster e-commerce

BY PATRICK THIBODEAU

Congress began its new session last week prepared to make online privacy and Internet taxation its top high-tech issues. But as lawmakers gear up for a flurry of privacy bills, the high-tech industry remains divided over whether privacy legislation will help or hurt e-commerce.

"I think that if it's done right, [privacy legislation] is a real potential boon to the industry in terms of allaying people's fears about security and privacy in e-commerce transactions," said Chris Kelly, chief privacy officer at Broadband provider Excite@Home Corp. in Redwood City, Calif.

But Harris Miller, president of the Information Technology Association of America in Arlington, Va., said there's no need for legislation especially with the advent of the Platform for Privacy Preferences Project (P3P) standard, which would convert a company's privacy statement into a format that could be read by an end user's browser, allowing consumers to compare any P3P-compliant privacy statement to their preferences.

"We continue to feel very strongly that legislation is [neither] necessary [nor] appropriate," said Miller. "The technology and self-governance models are working."

Tax Moratorium Fair?

Taxes will also be a big issue. The three-year Internet tax moratorium, which blocks new and discriminatory taxes on Internet transactions, expires in October. But since the moratorium was passed by Congress in 1998, there has been a great awakening among brick-and-mortar businesses about the fairness of a system that forces traditional retailers to collect sales tax in many states while Internet retailers generally aren't required to collect it.

David Ballington, a vice president at Wal-Mart Stores Inc. in Bentonville, Ark., said he believes the moratorium extension "puts off the tax fairness question." He said he will push Congress to also take up the tax fairness issue and support the effort in more than two dozen states to simplify taxes as a first step to requiring sales tax collection by all sellers.

Congress could divide along party lines and not accomplish anything this year. But the bipartisan support for privacy protections makes it "more likely to pass in this Congress than less likely, simply because of that interest on both sides of the aisle," said Steve Emmert, director of government affairs at London-based Reed Elsevier PLC, which owns the Lexis-Nexis information services.

The House Commerce Committee will see a raft of privacy bills "very early on" in the session, congressional sources said. One expected bill will establishing a government CIO position to coordinate and standardize federal IT initiatives. He was encouraged to stick with that plan by the high-tech executives at the meeting.

But according to IT industry sources, Bush may appoint a second IT official, possibly Floyd Kvamme, a partner at Kleiner Perkins Caufield & Byers in Menlo Park, Calif., to a position advising the new administration on tech policy.

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Industry sources, privacy

High on the Hill

Congress will take up key high-tech policy issues in earnest after the inauguration later this month.

PRIVACY Dozens of bills are expected, regulating many aspects of privacy, from use of Social Security numbers to comprehensive online privacy rules.

TAXES The Internet tax moratorium expires in October if Congress doesn't renew it.

SPAM Antispam legislation, which failed to pass last year, will return.

R&D TAX CREDIT Despite getting a five-year extension last year, high-tech groups will push Congress to make it permanent.

IMMIGRATION Firms will ask Congress to streamline hiring procedures.

Bush Courts High-Tech Companies, Ponders Posts

But fills Cabinet with Old Economy pros

BY PATRICK THIBODEAU

President-elect George W. Bush is making efforts to reach out to high-tech companies, after filling his Cabinet with executives largely from Old Economy firms.

Last week in Austin, Texas, Bush met with more than a dozen technology leaders, including Michael Dell, CEO of Dell Computer Corp. in Round Rock, Texas; Lou Gerstner, chairman of IBM; and Carly Fiorina, CEO of Hewlett-Packard Co.

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AT DEADLINE

Spectrum Hits $12.9B

Total bids for new wireless spectrum hit $12.9 billion on Jan. 4, a $1.2 billion jump since the previous auction round Dec. 21.

Verizon Wireless Inc. in Bedminster, N.J., was the leader in last week's bidding, with a total of $4 billion.

Two small companies backed by major carriers finished the 27th round of the auction just behind Verizon. Alaska Native Wireless, a consortium of Alaskan corporations in Fairbanks with a 39.9% interest held by AT&T Wireless Group in Redmond, Wash., submitted bids of $2.76 billion. Salmon PCS in Chevy Chase, Md., backed by Cingular Wireless in Atlanta, had total high bids of $2.2 billion.

Content Liability Eyed

Internet service providers, portal operators and others that handle third-party content shouldn't be exposed to criminal liability for content posted by outside parties, according to a House resolution introduced last week by Rep. David Dreier (R-Calif.).

Although this is just a resolution, Dreier is head of the Rules Committee, which is the traffic cop for House legislation. So the measure could be influential in shaping policy.

Lotus to Reorganize

Lotus Development Corp. is being restructured, with the bulk of the reorganization due to occur this quarter, a company official confirmed Jan. 5.

Details of the reorganization weren't provided and won't be until the company's annual U.S. user conference, Lotusphere, which will take place the week of Jan. 14.

News Corp. Layoffs

Fox Television Networks owner The News Corp. announced that it's shutting down its online division in a cost-cutting move expected to result in the elimination of nearly half of its 450 jobs.

The company will turn over the operation of News Digital Media's three main Web sites – Foxnews.com, Foxsports.com and Fox.com – to the Fox television networks with which they're associated.

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seek to give end users the ability to opt out from having cookies placed on their systems, the sources said.

The Senate Commerce Committee will likely see a reintroduction of Sen. John McCain's (R-Ariz.) privacy bill, which would require Web sites to disclose how data is used as well as give visitors to those sites a chance to limit how their information is used.

The privacy issue gained some attention in the November election. A number of winning candidates, including two freshmen senators — Bill Nelson (D-Fla.) and Maria Cantwell (D-Wash.) — highlighted Internet privacy in their campaigns.

"That really shows that this is an issue that may not be the rise and fall of a candidate but is something that is part of the package," said Ari Schwartz, a policy analyst at the Center for Democracy and Technology in Washington, a privacy advocacy group.

MOREONLINE

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For forums and complete security news, visit our Security Community at www.computerworld.com/security.

groups and other tech watchers contacted by *Computerworld* last week said none of Bush's appointments raise any tech-specific issues, with the exception of Bush's choice for attorney general — John Ashcroft, a former Republican senator from Missouri.

Ashcroft is considered to be somewhat of a libertarian on tech issues. If confirmed, he may review controversial Clinton administration projects, such as the FBI's Carnivore e-mail monitoring system, as well as U.S. involvement in the Council of Europe cybercrime treaty, which has raised privacy and business concerns.

Harris Miller, president of the Information Technology Association of America, said his group is backing Ashcroft because it expects him to be particularly sensitive to the commercial implications of law enforcement issues.

MORETHIS ISSUE

IBM shows interest in electronic voting systems, see page 12.

Former Dot-com Workers Find Slow Start in New Year

Many say job hunting is tough despite high demand for IT help

BY JULEKHA DASH

As dot-coms shed more staff to slash costs, many in the industry last week said the search for new jobs is getting tougher.

Internet firms announced 10,459 job cuts last month, an increase of almost 20% from November, according to Challenger, Gray & Christmas Inc., a Chicago-based outplacement firm.

Both Challenger and technology magazine *The Industry Standard*, which tracks dot-com layoffs, have reported that the majority of dot-com downsizings have occurred at e-commerce sites — particularly online retail sites — as well as at services firms, such as consulting businesses.

For example, eToys last week announced 700 layoffs (see story, page 8) and Engage.com announced 550.

Overall, demand for IT workers remains high. According to *Computerworld*'s Annual Hiring Forecast survey conducted this past fall, IT staffs will increase by an average of 4% nationwide in the first quarter and 13% during the year. And the nation's onemployment rate is still hovering around 4%.

But analysts and anecdotal evidence show that getting a new job isn't always so easy.

"A lot of companies are starting to question whether they need [to fill] all the open positions," said Marguerite Payne, 51, who was laid off in September from her job as a project manager at License Online Inc. in Bellevue, Wash. Payne said she has made it to third- and fourth-round interviews at several companies only to have employers say they decided not to fill the position or they decided to merge several positions into one.

Allison Hemming, who runs The Hired Guns, a New York-based consulting firm, said she sees IT workers attending her "pink-slip parties," at which former dot-com employees from New York's Silicon Alley mingle with recruiters and employers. Hemming's event has taken off in other areas as well, such as San Francisco and Los Angeles.

Patty Beron, founder of San Francisco-based online community sfGirl.com, launched her first pink-slip party last month. Beron said she expected 50 people to attend; more than 300 showed up. "I was surprised. I have more of a party mentality, but the minute people got there, they were exchanging résumés and talking about jobs," she said.

According to recruiters, January is typically a strong hiring month. But Lynsay Matthews, a project manager who was dismissed from Chicago-based Internet consulting firm Xpedior Inc. last month, said she hasn't had much luck since she sent résumés to more than a dozen firms. Matthews, a 15-year IT veteran, said that in some cases, she doesn't have the skills employers want, such as Java programming experience.

But experience counts, too. Jim Baillie, who was laid off as a Web programmer from an Internet portal last month, said his eight months' experience in Web development isn't enough for potential employers, who typically tell him they want a minimum of two years of experience. One hiring manager "blew me off like [I'm] nobody because I didn't have exactly what he was looking for," said Baillie, who lives in the Tampa, Fla., area. Baillie had previously worked with mainframes.

Payne said she remains "cautiously optimistic" about her job prospects. Hopefully, she said, start-up firms "will start realizing that they need [workers] with experience."

MORETHIS ISSUE

See "Recovering After the Shakeout," page 40.

Searching for New Jobs

A sampling of some recent dot-com layoffs:

COMPANY	TYPE OF COMPANY	NUMBER LAID OFF	WHEN
Engage Inc.	Online advertising	350	Jan.
Covad Communications	Telecommunications	400 400	Dec. Nov.
Scient Corp.	Consulting/ services	460	Dec.
IXL Inc.	Consulting/ services	850	Nov.

Ice Storms Freeze Systems

But IT preparedness keeps businesses going

BY JAMES COPE

Recent ice storms that snapped power lines in the Midwest and plunged whole towns into perpetual midnight also jolted businesses and governments into a new awareness of business vulnerability in the Information Age.

Unlike California, where just having enough electrical power is a vague pulsing threat, the storms that downed transmission lines in parts of Arkansas, Oklahoma, Texas and Louisiana were clean and brutal. Ice that was two to three inches thick weighed heavily on power lines, severing connections between generating facilities and distribution substations.

Manufacturing operations at the International Paper Co. plant in Texarkana, Texas, came to a halt on Christmas Day after power went out there, said process control group leader Tom Wacha. The uninterruptible power supplies "were drained by the following afternoon," Wacha said. "We brought in a generator on Dec. 27 to recharge them."

Michael Newcity, an e-commerce manager at ABF Freight System Inc. in Fort Smith, Ark., said his company was fortunate to have diesel-powered generators to keep the large trucking firm's data center up and running during a 24-hour period without public power.

Work-Arounds

There were two storms back-to-back, one on Dec. 13 and another on Dec. 25-26, said Dave Baldridge, a spokesman at SBC Communications Inc. in San Antonio. SBC supplies local phone access to the area through its subsidiary Southwestern Bell.

Bentonville, Ark.-based Wal-Mart Stores Inc. was hit hard by the ice, according to company spokeswoman Melissa Berryhill. However, she said it was business as usual at the retailing giant's main data center in Bentonville as technicians there fired up diesel generators. Berryhill said all of Wal-Mart's data is duplicated at another data center in Tulsa, Okla., and both data centers hook up with stores over redundant wide-area network backbones. "We have two of everything," Berryhill said.

Although the storm didn't knock out power at MD Building Products Inc., a maker of weather stripping products in Oklahoma City, Craig Wilkerson, the IT manager, said his company closed for a couple of days because slick roads prevented people from coming to work. He said systems maintenance wasn't a problem and that MD's IT staffers have dial-up access from home.

ABF's director of technical services, Dave Cogswell, said IT workers who couldn't get to his company's data center because of ice were able to tap into the firm's system over secure connections.

Remote access was possible for IT because much of the telecommunications infrastructure in the stricken area runs underground, said SBC's Baldridge. He also said Southwestern Bell central offices have backup generators that power phone systems during electric power outages.

Facing Tough Rivals, eToys Nears Oblivion

Online retailer lays off 700, shuts down European operation, closes warehouses

BY CAROL SLIWA

EToys Inc. last week became the latest online retailer to significantly scale back operations.

The struggling toy seller last week announced plans to lay off 700 of its 1,000 employees and close two warehouses, on the heels of a decision to shut down its European operations, including a U.K.-based Web site that will stop taking orders Jan. 19.

"This is an indication that they're having such a hard time that they're unlikely to stay in business for very long," said Seema Williams, an analyst at Forrester Research Inc. in Cambridge, Mass., who added that cuts were expected but the number was "remarkable."

In the middle of last month, eToys projected that it had enough cash to meet its needs only through March [News, Jan. 1]. Holiday sales that were lower than expected pushed the Los Angeles-based retailer to take last week's radical steps to reduce operating costs.

Lindsay Parker, an analyst at New York-based Deloitte & Touche LLP, declined to comment on eToys specifically but said she knows of many online retailers "very interested in being acquired." That's "the most desirable path," followed by a merger and liquidation of assets, Parker said.

What Were They Smoking?

"I guess a year ago, I don't know what we were all smoking," Parker laughed, commenting on the demise of dot-coms. "The reality of it is, there's a reason that Safeway didn't deliver to people's houses for years. They did the analysis and said, 'Gosh, you lose money doing that.' X number of years later, you still lose money doing that."

"We have observed a number of interesting and innovative business model attempts by the pure-plays over the last couple of years," said Don Gilbert, a senior vice president of IT at the Washington-based National Retail Federation. "Many of those were attempts that traditional, experienced physical retailers would never have tried."

Compounding its troubles, eToys finds itself in an increasingly tough market, as Toysrus.com Inc. has joined forces with Amazon.com Inc., and Wal-Mart Stores Inc. and Target Corp. have beefed up their Web sites.

"The problem was not [eToys'] prominence or its size. It was the market they happened to be playing in and the competition they continued to face. All of those conspired against them," said Williams.

Among the departing employees, 380 workers got laid off immediately, and the other 320 people will continue working through March.

As part of last week's announcement, eToys said it will close warehouses in California and North Carolina within 60 days and consolidate distribution at two other centers.

The demise of the European operation became apparent when the company posted a notice on its U.K. site detailing the Jan. 19 shutdown. As part of the closing, eToys said it's cutting prices by 50% on all products sold through that Web site and accepting returns of items bought after Dec. 29 only if they were defective or shipped in error.

"They have announced being dangerously low on cash, and this is going to be applicable overseas as well," said Heather Dougherty, an analyst at New York-based Jupiter Research. "The market conditions simply are not allowing for expansion of any sort, and time is short-lived to attempt to build market share without proving progress toward profitability." ▶

AT A GLANCE

Y2k Dot-com Demises

- At least 210 Internet companies folded last year.
- Nearly 60% of the shutdowns occurred in the fourth quarter.
- 75% of the shuttered dot-coms were in the business-to-consumer sector.
- 55% of the shutdowns involved e-commerce companies, 30% involved content companies.

SOURCE: WEBMERGERS.COM, SAN FRANCISCO

2000 Online Holiday Sales Estimate Cloudy

Rough consensus is $9B to $11B, but not everyone is measuring the same thing

BY DAN VERTON AND LEE COPELAND

With the holidays over, online retailers and the horde of independent think tanks that track them are busy trying to make sense of exactly who the winners and losers are.

But the picture is anything but clear. More than a half-dozen industry watchers have issued online holiday sales estimates during the past two weeks — all of them different and all of them covering different time periods, making comparison difficult (see chart).

Yet one analyst said there is some agreement, although it covers a wide financial range.

"Consensus is somewhere in the $9 billion to $11 billion range," said Sean Kaldor, vice president of e-commerce at Milpitas, Calif.-based NetRatings Inc., referring to what he said most analysts say is the value of goods sold online during the holidays.

Discrepancies aside, Jim Williamson, an analyst at IDC in Framingham, Mass., said there are strong indications that retail sales grew from the previous year. "There were issues of overall slowing in the consumer economy and holding back on spending because of fears of recession," said Williamson. "But more people were coming online and experimenting and converting more shopping [to] online."

Inaccurate analysis can have repercussions for companies looking for venture capital. "The investors are the ones that bank on validation from research houses," said Kaldor.

Forecasts differ for various reasons. "Some companies get wrapped up in an eagerness to have the highest forecast out there," said Kaldor. Also, companies may count different categories; for example, some include travel, but others don't.

COMPANY	FORECAST	REMARKS
Gartner Group Inc.	$19.5B $8.4B	Worldwide online "holiday" sales U.S. online holiday sales
IDC	$12B	Fourth quarter of 2000 only
Jupiter Research	$11.6B	November and December only
The Yankee Group	$9B	Fourth quarter, excludes travel and auto sectors
ActivMedia Research LLC	$8B	December 2000
The National Retail Federation and Forrester Research Inc.	$6.4B $4.4B	November only October only
BizRate.com	$6B	Nov. 20 through Dec. 26; includes 2,000 merchants
America Online Inc.	$4.6B	AOL customers during the holidays
NetRatings Inc.	78% increase in shoppers	Until Dec. 24; excludes travel and financial categories

And then there's the difficulty of comparing forecasts covering different periods of time.

"A week can make a big difference," said Helen Malani, a spokeswoman for Los Angeles-based online retail marketplace BizRate.com. "Forecasts are based on a set of assumptions, and the real world is fast-changing."

Some firms include transactions that were purchased, as well as generated, online but which were finalized off-line, such as automobiles.

"Very few cars are bought online," said Harry Wolhandler, an analyst at ActivMedia Research LLC in Peterborough, N.H. "But online is an important part of the car-buying process, and it's a mistake to discount the value of the Web on the economy by only looking at items actually purchased online."

Paul Ritter, director of online retail strategy at The Yankee Group in Boston, said that although every company prepares data differently, "the true test will be when the [U.S. Department of Commerce] numbers come out."

Stay tuned: That won't happen until February. ▶

MORE THIS ISSUE

Fewer dot-coms plan to advertise during the Super Bowl, but those that do are ramping up their infrastructures. See page 12.



VERITAS

BRIEFS

Palm, Sprint PCS Team on Handhelds

Sprint PCS Group plans to introduce cellular telephones based on Palm Inc.'s operating system in the first half of the year and will offer a kit to connect Palm handhelds to Sprint phones this quarter. Santa Clara, Calif.-based Palm and Kansas City, Mo.-based Sprint PCS said their new products are the result of a partnership announced last week that will also include development of a co-branded MyPalm portal. The portal will allow enterprise Palm users to access their corporate e-mail, sales tool applications and corporate directories through the Sprint PCS Wireless Web for Business suite of products and services.

Dispute Resolution Guidelines Proposed

The American Arbitration Association, with backing from Microsoft Corp., AT&T Corp., FedEx Corp. and 15 other companies, last week announced a set of proposed guidelines for resolving business disputes among corporations that engage in business-to-business e-commerce transactions with one another. The eCommerce Dispute Management Protocol is a prelude to the planned launch of a technology-focused arbitration service by the New York-based nonprofit group.

'Safe Harbor' Seminars Planned

The U.S. Department of Commerce has signed up only 12 firms and organizations so far for its hard-won "safe harbor" protections on data privacy, but U.S. officials last week said they believe a series of planned seminars will increase the number and bolster the protections' legitimacy. The seminars aim to inform companies about the safe harbor provisions and advise them on how to develop privacy policies necessary to become eligible to enter the safe harbor. The safeguards took effect Nov. 1 and aim to provide some legal protection to U.S. firms and organizations that, as part of their European operations, gather personally identifiable data about people living in Europe, including employees and customers.

J.C. Penney Shuffles Execs as CIO Retires

Changes come amid declining sales, profits

BY CAROL SLIWA

LESS THAN four months into his new job, J.C. Penney Co. CEO Allen Questrom last week announced several key executive changes, including the departure of CIO David Evans.

A well-known figure in the IT industry, Evans, 56, had worked for the Plano, Texas-based retailer since 1965. Evans' retirement became effective Dec. 31, according to a company statement. Evans couldn't be reached for comment.

"A true visionary. Very, very bright and a very nice guy. We will miss him," said Doo Gilbert, senior vice president of IT at the Washington-based National Retail Federation, whose Information Technology Council Evans has chaired for the past two years. "He was instrumental in setting up all the Internet infrastructure for J.C. Penney, and he was also instrumental in working on cross-channel integration."

The retailer has been working on several ambitious projects of late, including one aimed at integrating customer data and another at managing product content uniformly across its three channels. The company has also been working to improve its merchandising systems.

A J.C. Penney spokeswoman declined to comment on the status of those projects or on any of the management changes.

Evans' replacement, Stephen Raish, 50, is another longtime J.C. Penney employee. A 28-year company veteran, Raish most recently served as president of the company's strategic task force assigned to review all aspects of the merchandising processes.

The management changes come at a critical time, as J.C. Penney attempts to rebound from declining sales and profits. The retailer last week announced that preliminary sales for the five-week period that ended Dec. 30 dropped 1.5% to $4.66 billion from $4.73 billion in the same period in 1999. Department store sales fell 2.7% to $2.56 billion from $2.63 billion in the same period during the prior year.

But J.C. Penney's financial difficulties have been ongoing for some time. Profits for the firm's retail outlets and catalog operations plummeted nearly 50% between 1997 and 1999.

"They have now gone through a couple of years of poor performance, and my guess is there are some folks that feel there needs to be some significant shake-up — not just tweaking," said Steven Nevill, a principal at Kurt Salmon Associates in Atlanta. "They need to get some new concepts and ideas in the company."

COMING	GOING
CIO Stephen Raish, 50 (promoted)	David Evans, 56
Chief Financial Officer Robert Cavanaugh, 49, who was CFO of J.C. Penney's Eckerd drugstore chain	Donald McKay, 55
Chief operating officer, direct marketing, credit and facilities services: Job being restructured	John Fesperman, 55
President, catalog and Internet: Search under way	Randy Ronning, 51

Chemical Giants Open Online Marketplace

ERP-based trading system scheduled to follow this spring

BY MICHAEL MEEHAN

The highly active chemical trading market went online last week as heavyweights like Du Pont Co., The Dow Chemical Co. and BASF Corp. joined 13 other companies in creating the industry's first major online marketplace.

Run by Elemica Inc. in Philadelphia, the marketplace allows browser-based transactions now, with plans to let buyers and sellers send orders right into one other's enterprise resource planning (ERP) systems in the spring.

The chemical companies — 22 in all, including six that are not yet connected to the network — are also investors in Elemica and are hopeful that the new trading forum can achieve significant cost reductions in their supply chains.

"In the chemical industry, we are all buyers and sellers, and that is often not the case in your typical value chain," said Rick Olson, director of corporate electronic ventures at Wilmington, Del.-based Du Pont. "We sell to Dow and vice versa."

Olson said chemicals are traded many times as they're taken from their raw states, refined, formulated, fabricated and converted into usable goods. "It's not uncommon for a chemical to change hands several times before it winds up with an end user," he said.



RICK OLSON: The marketplace will trim supply-chain costs.

To enable the physical exchange of materials, firms have already built chemical pipelines running from facility to facility in parts of northern New Jersey and Houston. The Chemical Industry Data Exchange (CIDX), an industry consortium, was formed in 1985 to enable electronic transactions between companies via electronic data interchange.

CIDX now has a draft XML standard available, which Elemica is using, said Tom Gelrich, Elemica's head of product design and development.

Olson estimated that trading over electronic marketplaces could cut 10% to 15% out of Du Pont's supply-chain costs.

Randy Hempel, director of new business models and electronic ventures at Hunt Valley, Md.-based Millennium Chemicals Inc., said his company is particularly interested in trading through the ERP systems.

He said that Millennium has a fully integrated SAP enterprise system and that the firm's only attempt at building a connection into a single trading partner's ERP system proved costly. "One spot with multiple points of entry just makes a whole lot more sense," Hempel said.

Hempel said he believes that the ERP system, combined with the electronic marketplace, will allow Millennium to gauge shifts in demand much more quickly than it currently does.

"It will allow us to figure out what's going on out there and react to it as it's happening, and that's worth a lot of money," he said.

Both Olson and Hempel said the IT cost to plug into the network was minimal, though they couldn't provide specific figures.

MORE ONLINE

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Many Dot-coms Pass On Super Bowl Ads

Participation down significantly as many online firms refocus spending

BY JAIKUMAR VIJAYAN

CALL IT A sign of the times.

The number of dot-com companies planning to air commercials during this year's Super Bowl has dropped dramatically from last year.

In fact, a mere 10% of Super Bowl XXXV advertisers are dot-com companies, compared with about 40% last year, according to a spokeswoman for CBS, which will broadcast the game from Tampa, Fla., on Jan. 28. The rest of the companies are more traditional advertisers such as beer, automobile and financial firms, the spokeswoman said.

The drop is a sobering reminder of the hard times many pure-play online companies have run into, analysts said. Market research firm The Yankee Group in Boston estimates that with elusive profits and stagnant revenues, many pure-play dot-coms have slashed their advertising and marketing budgets by 50% to 70%.

Weighing Costs vs. Benefits

Many dot-coms are looking to redirect their money and efforts away from TV and print advertising to other forms of marketing, said Jay Ramadorai, an executive vice president at LastMinuteTravel.com Inc. in Atlanta.

"For many dot-com companies, it was a very foolish mistake to spend a large percentage of their budgets primarily on TV ads to gain access to a wide audience," said Paul Ritter, a Yankee Group analyst.

Companies such as Orlando-based online invitation card retailer OurBeginning.com Inc. last year spent nearly $4 million on Super Bowl commercials — or several times its total revenue at that time. While such campaigns certainly help raise brand awareness and boost traffic to a site, there is little evidence that they actually help drive sales, Ritter said.

"Success in online retailing comes from a great deal more than drawing a lot of visitors to your Web site," Ritter said. More important is the ability for the company to convert visitors into actual customers — and that means making more investments in marketing partnerships, infrastructure and technology, he said.

LastMinuteTravel.com, for instance, advertised during last year's Super Bowl but has no plans for a repeat performance this time around because "we just don't feel we'll get a bang for the buck," Ramadorai said.

The company's commercial during the final minute of last year's Super Bowl drove an additional 300,000 visitors to its site in the first five minutes after the commercial aired, according to Ramadorai.

"In terms of where we were last year as a company, we felt that we needed a big [brand awareness] push," which the Super Bowl commercials accomplished, Ramadorai said.

This year, the company is redirecting its dollars on co-branding efforts and partnerships with major portal sites.

Online job site Monster.com, on the other hand, is betting that it will get its money's worth from the Super Bowl this year. The Maynard, Mass.-based firm has purchased several spots — at an estimated $2.3 million to $2.4 million per 30-second commercial — before and during the game and is ramping up its IT infrastructure to handle the expected spike in traffic.



GEORGE NASSEFF: Monster.com has "had measurable success" with ads.

"For our business model, it makes perfect sense to advertise" at events such as the Super Bowl, said Monster's chief technology officer, George Nasseff Jr. "We've had measurable success for the past two years."

Last year, the company saw a 450% jump in traffic during the hour following its Super Bowl ads, and at one point soon after the game, the company was receiving a résumé every second.

Hardware Problems Shut Down eBay for 11 Hours

Outage blamed on data backup system

BY LUCAS MEARIAN

Online auctioneer eBay Inc. gambled and lost on a data backup system that failed last week, leaving potential users in the dark for almost 11 hours.

In a notice to its users, eBay said it had known for "a while that a potential [hardware] problem existed" but decided to delay replacing it until after the busy holiday season.

The outage began at about 11:34 a.m. Pacific time on Jan. 3 with a hardware failure in its shared-disk backup system. When technicians attempted to restart the system, another problem surfaced in the storage system shared by the primary and backup systems, according to San Jose-based eBay. A third backup system brought online at 2:45 p.m. Pacific time worked for about 40 minutes before failing, making the site inaccessible until 9:56 p.m., when it was finally restored, eBay said on its announcements board.

Although eBay said its site has been up 99% of the time over the past four quarters, the firm has been plagued with a number of outages related to heavy traffic.

In June 1999, eBay suffered a 22-hour service disruption, one in a long line of shutdowns that year that the company blamed on one of its Sun Microsystems Inc. E10000 Unix database servers. Contacted last week, Sun officials wouldn't confirm whether it was their equipment that failed this time, but instead referred questions to eBay, which didn't return phone calls by deadline.

Sun is eBay's primary hardware vendor, and last year's shutdowns were remedied with a backup system, according to eBay officials.

With regard to last week's outage, eBay said all auctions scheduled during down times had been extended by 24 hours. It also said it would provide refunds on any items affected by the shutdown.

EBay said it will again have to shut down its site in the next few weeks during slow periods for about six hours while completing hardware upgrades recommended by its vendor.

"We have already embarked on a longer-term program to distribute the database to many separate servers that will isolate any failure to a limited part of the site," eBay said in an online announcement. "We expect this to be complete within four weeks."

IBM May Seek Stake in Election Systems

Interest in electronic voting has increased

BY LEE COPELAND

IBM confirmed last week that it's eyeing the electronic voting market, which pundits predict will swell in the wake of the election debacle.

Janet Caldow, director of IBM's Institute for Electronic Government, said the company is "actively discussing" the potential of developing electronic voting systems.

"We've been looking at this for three or four years," said Caldow. "But there hasn't been a lot of interest until this watershed event of the 2000 election." Problems counting poorly punched ballots in Florida resulted in a 36-day delay in determining the outcome of the U.S. presidential election.

Caldow wouldn't disclose what type of investment the company is making in electronic voting systems. She said IBM will wait for federal and state governments to articulate their requirements and standards for electronic voting systems before it proceeds with a product initiative.

Anticipated Demand

"There is a lot of room for players in this market," said Christopher Baum, an analyst at Gartner Group Inc. in Stamford, Conn. "And we know we are going to see demand because every county was looking to make a change, even before the [2000] election."

A few technology firms, such as Compaq Computer Corp. and Unisys Corp. in Blue Bell, Pa., already have initiatives in place that are aimed at substituting aging punch-card voting machines with electronic systems.

In November, Compaq and Cisco Systems Inc. in San Jose, along with a venture capital firm, poured $10 million into VoteHere Inc. (*www.votehere.net*), a start-up in Bellevue, Wash., that makes electronic voting systems. VoteHere's system uses a shared public-key security scheme, which encrypts each ballot, and voters cast their ballot on a Compaq iPaq computer [Technology, Oct. 30]. The system was used successfully in trials in Arizona and California this past fall.

In the mid-1990s, Unisys implemented an automated voting system for cities in Brazil and supplied the country with 77,000 voting machines to collect 35 million votes.


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BRIEFS

McKesson HBOC Names Privacy Officer

Drug and medical products distribution giant McKesson HBOC Inc. last week became the latest company to appoint an executive who will be responsible for data privacy policies and procedures on a corporatewide basis. San Francisco-based McKesson HBOC, which has annual revenue of nearly $30 billion, said it named IT veteran Keith Mallonee to the new position of chief privacy officer. In that job, Mallonee will oversee all privacy-related matters at the company and its McKesson LLC subsidiary, which markets Web-based software and services to physicians and medical insurers.

Torvalds Releases Linux 2.4.0 Kernel

The much-anticipated 2.4.0 version of the Linux kernel has been released by Linus Torvalds, creator of the open-source operating system. The 2.4 kernel has been keenly awaited by Linux users and Linux companies such as Red Hat Inc., Caldera Systems Inc. and SuSE Linux AG for the past year because it will offer increased symmetrical multiprocessing scalability, making it easier for users to run corporate applications on Linux-based servers. The kernel source is available for download at *www.kernel.org/pub/linux/kernel/v2.4/*.

Short Takes

Marketing and interactive software maker ENGAGE INC. said it will cut half of its workforce, or 550 jobs, in an attempt to reduce expenses and make itself profitable. . . . E-commerce firm MERCATA INC. said it will close its doors at the end of this month because it has been unable to find sufficient financing. The company withdrew its initial public offering filing Jan 3. . . . HEWLETT-PACKARD CO. began volume shipments of its highest-end HP 9000 Superdome Unix servers. . . . The NETSCAPE 6.0 Web browser is now available for computers running SUN MICROSYSTEMS INC.'s Solaris operating system. . . . A Belgian court has granted troubled software vendor LERNOUT & HAUSPIE SPEECH PRODUCTS NV bankruptcy protection.

Barnes & Noble Takes Popular Literature Digital

But recent online book efforts raise questions about readers' acceptance of medium

BY DAN VERTON

BARNESANDNOBLE.-com Inc. last week announced plans to launch an electronic publishing business unit that the company said represents a "significant leap forward" for the world of online publishing.

The new unit, Barnes & Noble Digital, will create "a direct link between authors and their readers," the company said in a statement. The unit's first title will be *The Book of Counted Sorrows* by Dean Koootz. Work by new writers will also be sought.

New York-based Barnes & Noble Inc., the world's largest book retailer, and German media company Bertelsmann AG, owner of publisher Random House Inc. in New York, each own 40% of BarnesandNoble.-com. They didn't discuss revenue expectations for the new venture.

Michael Fragnito, publisher of Barnes & Noble Digital, called the formatioo of the new company "a bold step forward" and one that was "inevitable." Although e-books — which customers download electronically and then print out or read on-screen — woo't replace printed books, Fragnito said, electronic publishing will lower some manufacturing and distribution costs. That will lead to reduced prices and higher royalties for authors.

King Encounters Pitfalls

The announcement, however, comes just after Stephen King, one of the best-selling novelists of all time, opined on his Web site about the pitfalls of online publishing. King has been publishing an online novel, *The Plant*, in installments that readers can download at a price of $1 each.

According to King, there are three major problems with online publishing. "One is that most Internet users seem to have the attention span of grasshoppers," said King. "Another is that Internet users have gotten used to the idea that most of what's available to them on the Net is either free or should be.

"The third and biggest is that book readers don't regard electronic books as real books. Since *The Plant* experiment began in July, I've had dozens of people come up to me and say that they can't wait to read the story . . . when it's in book form." Nevertheless, he characterizes the project — temporarily on hiatus — as a success, noting that it will likely gross about $600,000.

Reading vs. Interacting

Robert Scholes, professor emeritus of modern culture and media at Brown University in Providence, R.I., said there are clear differences in function between paper-based and digital books. "Printed books are for reading. Digital books are for interaction," said Scholes. "Putting new books online doesn't make much sense to me." However, archival versions of popular titles and classic literature "could be very useful," he said.

Fragnito, who said he has talked with King's agent about the author's online venture, called King's electronic book "a great success and an extraordinary achievement." But he said it was a "sociological experiment" that not only answered questions about whether readers would come back but also raised new questions about whether authors really want to or should be online business managers.

Although some see King's earnings from *The Plant* as very un-Kingly sums, the author still sees poteotial in the world of online publishing.

"These are not huge oumbers in today's book market, but *The Plant* . . . is not a book," said King in his online missive.



BEST-SELLING AUTHOR Stephen King, who has been publishing his novel *The Plant* online, says he has found three major problems with electronic books: Internet users have "the attention span of grasshoppers," people expect everything on the Internet to be free and book lovers "don't regard electronic books as real books."

"Right now, it exists as nothing but electronic bits and bytes dancing gaily in cyberspace. . . . Mostly it's just an electronic mirage . . . with no printing costs, publisher's cuts or agents' fees to pull it down."

7-Eleven Systems Hit by Y2k-like Glitch

Bug attributed to proprietary software

BY JENNIFER DISABATINO

Customers at convenience stores operated by 7-Eleven Inc. were a little inconvenienced last week wheo the company's point-of-sale systems experienced a Y2k-like glitch.

Dallas-based 7-Eleven confirmed that on New Year's Day, the cash registers at its 5,300 stores identified the date as Jan. 1, 1901. That left the company's main systems unable to process credit card transactions until a patch was ready Tuesday night, a spokeswoman said.

However, the manual process of using imprint machines and other backup techniques to handle credit cards kept business humming. The snafu "didn't have much of an impact on sales," the spokeswoman said.

The bug, attributed to proprietary point-of-sale software, may not be Y2k-related, the 7-Eleven spokeswoman said, but the company still can't say what caused the problem.

Testing 1, 2, 3

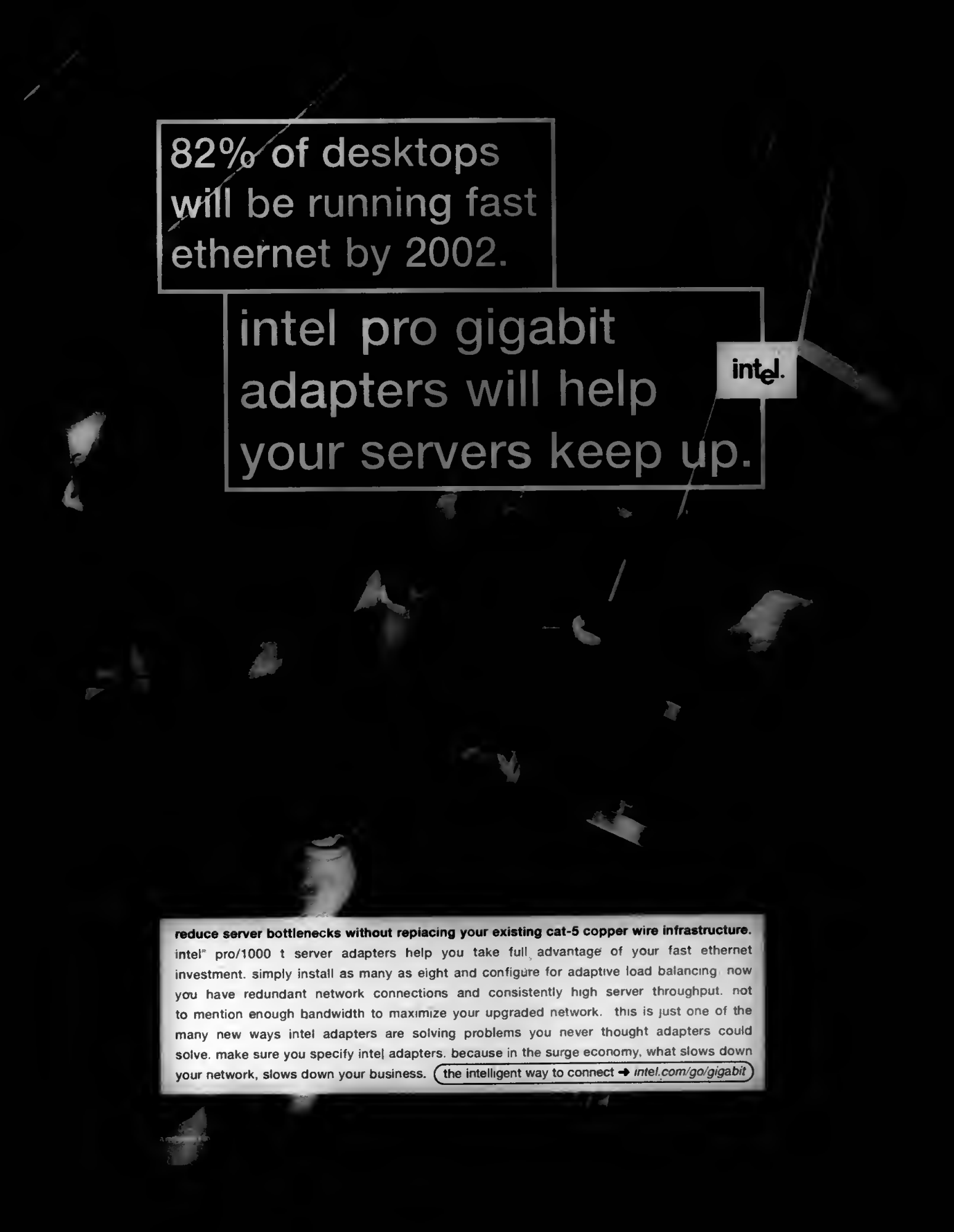
The company spent $8.8 million upgrading its systems before the year 2000 changeover — a relatively small amount, because the chain had already installed a series of Y2k-compliant software packages and systems during the 1990s.

IT workers at 7-Eleven ran about 10,000 tests on the company's software during the remediation process, the spokeswoman said.

Meanwhile, another Y2k-type problem was reported in Norway, where the country's modern high-speed Signatur trains ground to a halt on New Year's Eve, according to the *Dagbladet* daily newspaper.

In all, 29 trains failed to start on Dec. 31 because the onboard electronics were unable to recognize the date Dec. 31, 2000. Engineers temporarily fixed the problem by resetting the trains' clocks to Dec. 1, which gives the national railway company Norges Statsbaner and the German manufacturer of the trains, Adtranz AG, one month to find a permanent solution, *Dagbladet* quoted officials of the two companies as saying.

Material from the IDG News Service was used in this report.


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Banks Pushing Into B2B Portal Market

But they face heavy competition from e-marketplaces

BY MARIA TROMBLY

With a virtual product and a customer base of people and companies that are steadily moving online, banks have joined the rush to set up e-commerce portals for their business and retail customers.

Banks want to hang on to their high-margin cash management and transaction processing businesses rather than let third-party e-marketplaces snare that business from them, said Avivah Litan, an analyst at Gartner Group Inc.

The biggest U.S. banks — including Citigroup Inc. and Charlotte, N.C.-based Bank of America Corp. — already provide payment processing services to third-party business-to-business exchanges. Setting up e-marketplaces of their own allows them to play yet another market segment, Litan said.

But in a recent survey by Stamford, Conn.-based Gartner of 130 major U.S. companies outside the service sector, respondents said they viewed technology companies as more aggressive and more competent when it comes to putting invoicing and payment services online. Only 10% of the respondents said banks will have a leading role, Litan said.

"Banks are not set up to sell these solutions. They're not set up to integrate them. They don't have consulting teams to go out and integrate old technology into these marketplaces," she said.

But according to Bank of America spokeswoman Eloise Hale, banks do have an advantage over third-party exchanges in that they can more easily provide money-handling functions.

That's the case with Bank of America's e-marketplace, she added, where businesses have access to an easy-to-use procurement system (*www.bankofamerica.com/businesscenter*).

"Say you as a manager authorize two or three employees to make purchases," Hale said. "You can automatically set a dollar limit for each person, and should they request something over that, an e-mail automatically goes to you for authorization."

Bank of America began rolling out its e-marketplace in September, starting in the Baltimore/Washington area and parts of the North and South Carolina for corporate customers. Hale said the bank will expand it to other markets across the nation this year.



WELLS FARGO'S Deborah Ball

San Francisco-based Wells Fargo & Co. has one of the most successful business portals among major banks, according to Litan.

Wells Fargo's e-commerce portal was launched last quarter, allowing corporate and retail customers to acquire office, printing and computer supplies online.

Like Bank of America, Wells Fargo has an online procurement service with built-in checks and balances already up and running, said Deborah Ball, a senior vice president of the bank's wholesale Internet solutions group.

Wells Fargo doesn't offer industry-specific products such as auto parts, chemical supplies or computer components through the portal (*http://biz.wellsfargo.com/index.jhtml*), but it may start moving in that direction later this year, Ball said.

So far, however, business customers have primarily asked for office supplies and other materials used in day-to-day operations, Ball said.

That makes Wells Fargo's portal, and other banks' e-commerce sites, an ideal venue for office supply vendors such as Itasca, Ill.-based Boise Cascade Office Products Corp.

"We're currently on about 10 bank-sponsored e-marketplaces," said David Wilson, Boise Cascade's e-business development manager. "I think bank exchanges have a great chance of success because of the built-in loyalty of the small business banking customers. There's a reason to go to the Web site — to conduct banking business. So it's logical to take advantage of the office supply storefront while there."

VeriSign Invests in Wireless Biometrics

Security vendor in partnership with Identix

BY JAIKUMAR VIJAYAN

Security vendor VeriSign Inc. last week announced a partnership with Sunnyvale, Calif.-based Identix Inc. under which the two companies will jointly offer biometric authentication services to wireless service providers.

As part of the deal, Mountain View, Calif.-based VeriSign will integrate its digital certificate and encryption technology with Identix's Itrust suite of biometric authentication and content protection services and products.

Itrust was announced last July and will become available to service providers and portal sites by the second quarter. The service lets users of wireless services and products authenticate their identities using fingerprints and faceprints.

With VeriSign's backing, Itrust can offer a range of validation and nonrepudiation services for things like digital signatures, which are likely to be needed as wireless Web commerce begins to take off, said Charles Kolodgy, an analyst at IDC in Framingham, Mass.

"We believe that biometric devices will play a large part in the wireless world," where it's often more difficult to authenticate users and services, Kolodgy said. "You can expect to see a lot of [biometric authentication devices] popping up in handhelds and phones in 2002 or so," he added.

VeriSign is the second major company to team with Identix on Itrust. Last July, Schaumburg, Ill.-based Motorola Inc. invested more than $3 million in the company and announced plans to use Itrust hardware, software and services for fingerprint-scanning devices in future Motorola handheld units.

Continued from page 1

Starbucks

technologies, it opted for wireless LAN. Huston said wireless LANs provide a higher-speed connection than those that are provided now or that are likely to be provided in the future by cellular phone carriers. He said he expects early users of the service to include "road warriors who don't want to check their e-mail [in a hotel] from a 28.8K connection."

MobileStar Network Corp. in Richardson, Texas, will install industry-standard 802.11B wireless radios and antennae in Starbucks stores, with the first installations to be completed this spring, probably in the Pacific Northwest, Huston said. "We will aggressively roll it out [to all North American outlets] over the next two to three years," he added.

Alan Reiter, an analyst at Wireless Internet and Mobile Computing in Chevy Chase, Md., said Starbucks' widespread use of wireless LANs will help resolve the chicken-and-egg problem that's faced by any new technology. "This can only help [the adoption] of wireless LANs because of economies of scale, which means more products and more competition," Reiter said.

Starbucks is weighing several options to drive adoptinn of wireless LAN technology, Huston said, including the sale of wireless modem cards in stores "if it does not interfere with the coffee experience."

Starbucks has also started preliminary discussions with major laptop computer manufacturers to provide "incentives" for the purchase of wireless LAN devices, Huston said. He declined to provide further details, however.

Mark Goode, president and CEO of MobileStar, said the company has configured its wireless network for business users, with built-in support for virtual private networks (VPN). "VPN is the fundamental driver of our network architecture," Goode said. "From the point of view of the VPN, the MobileStar connection is just another LAN with an IP [address]."

Starbucks customers will pay for access based on MobileStar's standard network fees, which range from $2.50 for 15 minutes of access to monthly rate plans priced at $15.95 for 200 minutes, $34.95 for 500 minutes and $59.95 for unlimited access. MobileStar plans to initially install one wireless LAN radio in each Starbucks shop. One LAN can "support 20 to 40 users at a time . . . and we believe that exceeds the seating capacity of most Starbucks restaurants," Goode said.

Customers will access the MobileStar network through a portal that Microsoft Corp. is developing for Starbucks on its MSN online service. Access to that portal carries no charge, but once customers surf beyond that or go to check their e-mail, they will either have to enter a MobileStar user number or sign up online, a MobileStar spokesman said.

Tim Scannell, an analyst at Mobile Insights Inc. in Quincy, Mass., said Starbucks has positioned itself too far ahead of the technology curve with the wireless LAN deal. "How many people have a wireless modem today? This is too early and too soon," he said.


New Year's Resolutions :
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2. Quit smoking
3. Lose weight
4. Stay on top of the latest trends
5. Stop wasting time
6. Have more efficient meetings
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9. Talk personally with prospective clients
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IT Under Siege: Conflict Poses Extreme Challenges

Middle East violence leads to outages, canceled meetings, employee fears

BY MARK HALL AND PIMM FOX
JERUSALEM

PALESTINIAN IT consultant Sam Bahour was in Tel Aviv last September for Comdex/Israel. It was something of a historic eveot: tbe first time there had ever been a Palestinian-only exhibit of IT companies seeking partnerships with Israeli companies. And it was a hopeful sign of better relations between the longtime enemies.

But not far away, in Jerusalem, Palestinian youths hurled rocks at Israeli soldiers, who fired back, killing six and wounding almost 200. The Palestinians were angered by an Israeli right-wing politician's Sept. 28 visit to a venerated Islamic site.

And with that new burst of bloodshed, "the last three years of positive growth between the two countries came to a halt," said Bahour, managing director of Applied Information Management, an IT and telecommunications research firm in Ramallah.

A daily cycle of deadly clashes has continued for months. In addition to breaking the relative peace that had lasted several years, the *intifada* — the Palestinian uprising against Israel — has made working in IT more difficult than ever and shattered the fragile IT relationships that were beginning to form in the region.

The day before the violence erupted, for example, Cisco Systems Inc. Chairman John Morgridge had inaugurated an academy at Birzeit University in Palestine to train instructors in Cisco technology. But after the incident in Jerusalem, the program was put on hold.

Similarly, Batami Sadan, director of informatioo systems at Hadassah-Hebrew University Medical Center in Jerusalem, had just completed delicate negotiations for a Middle East conference on medical IT — witb the compromise to hold it in both Tel Aviv and Amman, Jordan. But Sadan said the current crisis unplugged the long-sought conference.

"I have tried through international organizations to discuss information technology issues we have in common with Palestinian colleagues," said Sadan.

At the ground level, trying to get IT projects accomplished in what is essentially a tribal war zone is enormously difficult for both sides, according to IT professionals in the region who were interviewed.

> I have tried through international organizations to discuss information technology issues we have in common with Palestinian colleagues.
>
> BATAMI SADAN, DIRECTOR OF INFORMATION SYSTEMS, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER



Naim Al-Khushashi, general manager at The Palestine Securities Exchange Ltd. — the autonomous region's Nablus-based stock market — said his IT staff has had ongoing struggles just getting to work because of Israeli border checkpoints. He said the stock exchange has also been hampered by leased telecommunications lines being cut off and by delays in getting computer and networking equipment.

To get around the checkpoint problem, Al-Khushashi said, he often arranges for his out-of-town staff to stay at the homes of friends or relatives in Nablus.

Bahour, who does IT consulting work for the Palestinian Ministry of Economics, said be believes the "Israeli occupation" makes it even harder than usual to find qualified technical personnel.

Bahour cited Israeli policy that limits visas to two years, even for desperately needed IT professionals who could help Palestinian businesses grow and reduce the nation's 40% unemployment rate. A native of Youngstown, Ohio, Bahour said that Israel "shoots itself in the foot" by making it difficult for "diaspora Palestinians" to return to the region.

At ESC Medical Systems Ltd., a medical equipment manufacturer in the northern Israeli city of Yokneam, a spokeswoman said employees "felt under siege" and some were afraid to come to work after the September violence flared up.

"Everyone was stunned by what happened, and all of a sudden, people were afraid to drive through Arab villages to get to work. Tires were burnt, there was shooting. People were concerned," she said.

ESC quickly implemented a two-pronged contingency plan for operations during the conflict. First, the IT shop backed up all manufacturing, engineering and financial documentation and sent copies to a safe location overseas. Then the company moved its excess inventory offshore as well.

But now that the violence has subsided, so has much of the fear. "People have short memories, and [now] some seem more worried about the lack of parking," the spokeswoman said.

Living With Conflict

In one sense, war has become a way of life in the region, said Gili Raanan, a senior vice president at security software company Sanctum Ltd. in Herzliya, Israel. "We have been at war since 1948," he said. "It's part of the atmosphere."

The wartime atmosphere even seeps into the IT education system. Israel's compulsory military service means that most IT managers got their start in the armed forces — and then went to college afterward, said Avraham Shitzer, vice president for research at Technion-





A PALESTINIAN throws stones at Israeli soldiers during clashes in Ramallah. The violence has made some IT workers afraid to go to work.

Israel Institute of Technology. In previous wars, the university sent teachers to the front to educate the troops. Today, lectures are recorded on tape for students who get called up for military duty.

"To survive here, you have to be strong," Shitzer said. "If we fail in our education, we suffer. If [the U.S. education system] fails, you bring in immigrants."

Israel's clear technological and educational superiority cootributes to the tension. "Palestiniaos don't see the conoectioo between Israel's affluence and its technology," according to Shitzer.

Marwan Tarazi, director of the IT unit at Birzeit University, said he disagrees. He acknowledged that "Palestine is a peasant community," but he said education is a high priority and that leaders of the Palestinian National Authority believe the emergent natioo's economy will be based on tourism and IT.

Meanwhile, the hostilities have spread to a new dimension: cyberspace. NetVision Ltd., a leading Internet service provider in Haifa, Israel, discovered that some of its customers, particularly government Web sites, were coming under heavy online attack immediately after the riots in the West Bank and Gaza began.

The online assault came in two forms. Denial-of-service attacks pounded Web sites with brute force to overload them. But there were also more sophisticated, application-level attacks that executed commands inside the servers themselves. "Most of the attacks did not come from the occupied territories. They originated from the U.S., Europe and the Islamic world," a NetVision spokesman said.

Room for Optimism

People on both sides said they agree that the conflict will get worse before it gets better. But relative optimists like Bahour said they view the current crisis as "a hiccup" and hope stability — and prosperity — will come soon. They even suggested that the Internet and IT could somehow build bridges between the combatants and boost the local economies.

"The Internet provides us with a platform for potential business ventures," Bahour said. "It also provides a communication medium — free of Israeli checkpoints — that allows equal interaction to take place betweeo the two peoples."

For example, Bahour and an Israeli partner are working on the Middle East Virtual Community, which uses the Internet to host virtual conferences on regional economic issues. The project is funded by the Truman Institute for Peace at The Hebrew University of Jerusalem and hosted by a Palestinian Internet service provider.

Others have high hopes for IT collaboration, too. Tamar Nour, CEO of New York-based Sphera Corp., an applications hosting company with a research unit in Ramat Gan, Israel, said she "would love to have a group of programmers working in Ramallah."

But Nour said she's resigned to the fact that "this is not Switzerland. It won't happen soon."



IT, Internet Regarded as Region's Economic Saviors

But labor shortage hinders growth

BY PIMM FOX AND MARK HALL
HERZLIYA, ISRAEL

Hard as you try, you can't separate IT from politics in the Middle East. IT in general — and the Internet specifically — are viewed as the white knights of economic growth and prosperity, the saviors of every sector except the already-rich oil industry.

But that's a very tall order, especially since the region faces a severe IT labor shortage. A recent report by Framingham, Mass.-based IDC said that in Israel alone, the gap between the number of qualified IT professionals and the demand will be more than 7,000 people by 2003.

One program currently trying to reduce this shortfall is the Cisco Networking Academy, which offers 280 hours of instruction in Cisco technology. The program is designed to teach teachers at the regional academy level so they can then teach at the local level.

Using a combinatioo of intelligence, charm and instinct, Cisco Systems Inc. employee Zika Abzuk manages to keep the program going, even amid the current violence. While the program gets attention for its Palestinian/Israeli cooperation, Abzuk has also taken it to Druse villages, Orthodox Jewish high schools and Bedouin students.

But the delicate threads of cooperation are easily broken.

Abzuk told the story of several Palestinian students who registered to take classes in April — side by side with Israelis — at a Jewish religious school in Jerusalem. "They came and were surprised, I think, to see that they would be treated normally by Israelis," she recalled.



ZIKA ABZUK: Cisco's IT program encourages cooperative learning.

But one day, as the students tried to cross a variety of Israeli border checkpoints, the soldiers made them "stand there for hours" and they were late for school. When they finally arrived, a new guard at the school didn't know about the Palestinian students and refused to let them in until an instructor was summoned.

Angry and demoralized, the students arrived at the class and e-mailed news of their ordeal to their Palestinian sponsor. "He e-mailed them to pack up and leave immediately," said Abzuk, "and I can understand their feelings."

The studeots later returned to the cross-border program — until the September violence erupted. Now "everything between us is halted," Abzuk said.

MORE THIS ISSUE
For more about how the Middle East conflict is affecting IT in the region, see page 34.



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Microsoft

Web Portal Picks Instant Messaging Newbie for Service

BY JENNIFER DiSABATINO

Some users and experts are looking beyond the interoperability wars between instant messaging (IM) services to companies that can add applications and content to IM clients. One such user is iWon Ioc., a consumer portal that plans to offer IM service and won't use America Online Inc.'s Instant Messenger.

Dulles, Va.-based AOL's Instant Messenger still can't chat with users of Microsoft Corp.'s MSN Instant Messenger or Santa Clara, Calif.-based Yahoo Inc.'s Yahoo Messenger. The Internet Engineering Task Force is trying to create interoperability standards between IM services, whicb iWoo executives said they believe will happen. "I think eventually AOL will have to open up," said John Park, group vice president of product management at iWon. That's why the Irvington, N.Y.-based company focused on an IM product called Jabber that allows application and content add-ins, he said.

Chat Amongst Yourselves

Park said iWon is developing its own client from scratch and that it will look nothing like the opeo-source version available at the Web site of Jabber, a subsidiary of Webb Interactive Services Inc. in Denver. That client will be connected on the back end to server software from Jabber, he said.

This will allow iWon to create a unique client that its members can use to cbat among themselves and, eventually, with users of other services. They will also get streaming content and notification from other kinds of Internet messaging, like phone messages over the Web. Park said he hopes to have the new IM service running on iWon sometime next month.

The Jabber IM software is open-source and XML-based, with an affiliated, proprietary commercial product.

A Jabber spokesman said the iWon announcment marks the first public disclosure of a deal in which a large customer agreed to license Jabber's commercial IM products. He declined to reveal the terms of the deal.

Backed by CBS Television Network and Viacom Inc., both in New York, iWon was the fifth-most-visited site on the Web, according to a November rating by Nielsen//NetRatings, a joint service of New York-based Nielsen Media Research Inc. and Milpitas, Calif.-based NetRatings Inc. The site also ranks as the Web's "most loyal" site, placing first in repeat visits, according to New York-based Jupiter Media Metrix Inc. in a November ratings assessment.

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Six More Workers Sue Microsoft for $5B

Company denies allegations of racial bias

BY TORO R. WEISS

FOR THE SECOND TIME in six months, Microsoft Corp. last week found itself the target of a racial discrimination lawsuit filed by former or current employees. But the company, while declining to comment on the suit, said it has improved its record in minority hiring and pays for scholarships to attract minorities and women to the field.

Figures cited by the plaintiffs claim that African-Americans make up about 2% of Microsoft's workforce. The company offered numbers applying to minority employees in general, who make up more than 20% of Microsoft's staff.

Last week's legal action adds six new plaintiffs to a lawsuit filed last June and expands the case into a $5 billion class-action suit covering current and former African-American employees of Microsoft since 1992. The suit, filed in U.S. District Court in Washington, alleges that the plaintiffs were overlooked for promotions, pay raises and other advancements because they are African-American.

The plaintiffs also allege that their race played a significant role in wrongful terminations and retaliation by the company after they complained about their treatment.

"Microsoft has discriminated against African-American employees who made valuable contributions to the company but were not treated with the same dignity, respect and compensation as their white counterparts," the plaintiffs' attorney, Willie Gary, said in a statement. He couldn't be reached for additional comment.

Microsoft's vice president of human resources, Deborah Willingham, said in a statement that the company "has a zero-tolerance policy toward discrimination in the workplace" and takes "any allegations of discrimination very seriously." She didn't comment directly on the allegations in the 66-page lawsuit, saying the company hadn't seen it. Microsoft declined to make executives available for interviews.

Making Progress

Willingham also said that Microsoft has been "making progress in attracting more minorities and women" but that such hiring has been challenging for many IT companies. She said the company's figures show that its minority workforce has grown nearly twice as fast as its domestic workforce overall during the past three years. The percentage of minority employees has risen from 16.8% in 1997 to 22.1% today, she said.

But Gary said statistics show that the company does little to hire or retain African-Americans. He said that in 1999, Microsoft had 21,429 workers, of which 2.6%, or 553, were African-American. And of the firm's 5,155 managers, 1.6%, or 83, were African-American, according to Gary's figures.

Willingham said Microsoft has invested almost $100 million to attract women and minorities into technical fields, including an $86.4 million partnership with the United Negro College Fund.

The original discrimination suit, filed in June on behalf of former Microsoft salesman Rahn Jackson, is pending before U.S. District Court Judge Thomas Penfield Jackson in Washington, the same judge who ruled against Microsoft last year in the renowned federal antitrust case. ▶

JUST THE FACTS

Class-Action Suit Grows

A racial discrimination lawsuit against Microsoft by an African-American former employee has been expanded into a class-action suit.

- The plaintiffs allege they were overlooked by the company for promotions, pay raises and other advancement because they are African-American.
- The current and former workers range from entry-level jobholders to management-level employees.
- The original lawsuit, filed last June on behalf of one former worker, is now open to all affected African-American employees at Microsoft since 1992.

Gloomy Report on Storage Sales Draws Sharp Criticism

Robertson Stephens forecast contested

BY LUCAS MEARIAN

A report by investment banking firm Robertson Stephens Inc. that predicts data storage and security software sales will drop in the first half of this year has been sharply criticized by industry analysts.

The report, released Jan. 2, said businesses, wary of a sluggish economy, will cut back their IT budgets for storage and security software.

Dane Lewis, an analyst at Robertson Stephens in San Francisco, reduced ratings on several vendors from Buy to Long-term Attractive. Companies whose ratings were reduced included enterprise-class storage vendor EMC Corp., midrange storage vendor Network Appliance Corp. and storage management software maker Veritas Software Corp.

The move sent shares of stock among those IT companies plummeting by as much as 25% before Federal Reserve Chairman Alan Greenspan cut overnight bank lending rates by half a percent Jan. 3, spurring a market rally. EMC's stock shot up more than 11 points by the end of Jan 3.

Data storage industry analysts criticized the Robertson Stephens report as confusing general IT spending — which analysts agree will slow — with storage needs.

Steve Duplessie, an analyst at Enterprise Storage Group Inc. in Milford, Mass., said the report is "entirely wrong." He said spending on storage systems isn't discretionary and that storage requirements are "absolutely not slowing. If anything, it's the opposite."

Mixed Signals

EMC spokeswoman Dana Buchbinder said the company speaks with more than 1,000 customers on a quarterly basis and has had no indication that storage sales are waning. EMC's third-quarter net profits rose 55% year to year to $458 million, and revenue increased 34% to $2.28 billion. The Hopkinton, Mass.-based company forecasts $12 billion in sales this year, matching Robertson Stephens' forecast until the firm cut its prediction to $11.7 billion last week.

Ed Broderick, an analyst at the Robert Frances Group in Westport, Conn., said he was shocked by the rate at which vendors' stocks plummeted after the report's release.

Broderick described the report as a "doomsday" scenario whose logic relies solely on poor sales throughout the entire IT market. He predicted the enterprise storage market will continue to grow at an annual rate of about 20%. ▶

Swinging Stocks

Stocks of about 30 data storage and security companies, including storage industry leader EMC, dropped by as much as 25% after Robertson Stephens lowered its rating of them, citing slumping economic conditions. EMC shares dropped about 10%, or $2.19 per share, Jan. 2, to close at $54.31.



BRIEFS

Network Associates Taps New CEO

Antivirus software specialist Network Associates Inc. announced last week that George Samenuk will serve as its new CEO and president. Samenuk most recently served as the CEO and president of Valhalla, N.Y.-based online business surplus exchange TradeOut.com Inc. Before that, he was an executive at IBM for 22 years.

Network Associates lost its CEO, president and chief financial officer last month when they all resigned in the wake of a harsh downturn in the vendor's financial forecast. The Santa Clara, Calif.-based firm's stock plummeted following warnings of lower revenue for the fourth quarter, which ended Dec. 31.

BMC Raises Q3 Expectations

Amid profit warnings from software vendors, BMC Software Inc. had some surprising news last week. The mainframe and client/server systems management software company raised its forecasts for third-quarter revenue. BMC said it now expects to report revenue of between $375 million and $380 million. The Houston-based company didn't provide any reasons for the change. BMC had a rough time last year, reflected in both its first- and second-quarter fiscal 2001 results, largely due to a decrease in demand for its mainframe software.

CRM Vendor To Cut Workforce by 13%

Looking to reduce its expenses, customer relationship management (CRM) software vendor Pegasystems Inc. announced plans to cut its workforce by 13% and warned that fourth-quarter sales will likely be below expectations. The Cambridge, Mass.-based maker of rules-based CRM applications for use on the Web and in call centers said revenue in the just-ended fourth quarter will be down about 20% from the $22.7 million it reported in the third quarter. Pegasystems attributed the decline to delays in the sales of several software licenses that it had counted on for the fourth quarter.

MARK HALL

It's No Mac World

CONSUMERS WHO ATTEND Macworld Expo Web will have multiple course options to choose from. But IT professionals will have almost no sessions to attend at this week's event in San Francisco. In fact, the first course offered to "Mac Managers" is called "Linux for the PPC."

That sums up the situation for the venerable Macintosh as the alternate operating system in corporations these days. No longer is it considered the long-shot underdog amoog the fire-breathing oppositioo to anything from Microsoft. Linux now plays that role.



MARK HALL is *Computerworld*'s West Coast editor. You can contact him at mark_hall@computerworld.com.

Apple Computer did make a bit of a comeback with the return of Steve Jobs, who may be wishing he remained interim CEO instead of taking the position full time. But that comeback was built on the narrow shoulders of an installed base desperate for new machines and first-time buyers enamored by computers that came in jujube colors. Broad-based, deep-pocketed corporate IT buyers have been ignored by Jobs and his product planners. As a quick fix to Apple's financial woes, Job's strategy worked. But as a long-term plan for the Mac's success, it's failing.

Apple's confused server OS strategy (another color-coded mystery that devolved into something called "X" or "10" by supporters) hobbled the company just as Linux was making inroads into IT shops. And Linux servers run things IT really wants, such as Internet applications. Mac servers run, well, file and print services for Macs, which Windows and Linux do just as well. Today, there's no reason for IT managers to consider the Mac in their product plans, which is appropriate since Apple doesn't think of them either.

Now, this may not mean that Apple will go belly up or that the Mac will go the way of the NeXT cube. But it does mean that Apple, which once held a credible position inside large enterprises, is now completely irrelevant to the IT professionals who shape the way computing will be done in the future.

Again, this is no eulogy for the Mac. It remains the best machine to create music on, and it still rules in the productioo departmeots of publishing and graphics businesses. But these markets are eroding for Apple, and neither is enough to sustain the kind of research and developmeot it takes to huild an operating system and developer community.

What will become of the Mac then? It could possibly offer the best user interface on Linux. That should make Macworld Expo's "Linux for the PPC" class a sellout. ◗



PIMM FOX

IT Leaders Must Rise in Face of Tougher Times

RISING ENERGY COSTS, higher prices for raw materials and a slowdown in home building characterize the current state of the economy. The corporate landscape is dotted with weekly layoffs numbering in the thousands. The stock markets have been tumbling.

The view from Silicon Valley isn't pretty either.

Funding for new technology companies has dried up. Some hlame the end-of-year doldrums, while others speculate it's because there are oo longer viable exit strategies for these new firms.

Here in the Valley, hiring is frozen, people looking for "business development" work draw smirks and working full time at half pay is the new incentive program, with stock options being the not-so-funny punch line of the great joke about working for Internet firms.



PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

Recently, I talked with a stock trader who specializes in technology shares. "I call this 'death by 1,000 paper cuts,'" he said, describing last year's fall of the Nasdaq. Each day, he told me, sounding slightly shell-shocked, it gets more and more difficult to sell shares. There's no liquidity.

So what does this have to do with IT?

From the 22nd-floor headquarters of the IT department at Thomas Weisel Partners, a San Francisco investment bank that specializes in emerging growth companies, you can see the prison walls on Alcatraz Island. The view and the technology areo't cheap. Atop this aerie at the Pacific Telesis Center sits some of the most powerful technology around. A 50-foot-wide bank of large-scale flat-panel screens surrounds a new trading floor with 124 workstations, each with three flat-panel displays. Each trader will be using technology maintained by a team of 76 IT professionals. And the traders will be looking to trade stocks so that the company can pay the IT hill.

While the IT department's responsibilities also include telecommunications, enterprise engineering and husiness systems, all must demonstrate strategic competitive advantage.

For 350 users, technology at Weisel Partners conjoins operations in San Francisco, New York, Bostoo and London. It's an information-intensive business that depends on an IT infrastructure par excellence.

This is the future we envision wheo we think about the possibilities for IT.

But how can companies afford it? Where does the money come from for the blond wood and Ellsworth Kelly painting just outside the server room? How do you pay for the rooms full of Cisco equipment when whole divisions are being downsized? Is the IT department next?

The tide has gone out of technology investing. Corporate job cuts will ripple through IT departments as projects are put on hold or canceled.

IT managers who demonstrate real effectiveness in helping divisions generate profits are the ones who will survive. The silver lining of this tech disaster may be that a slowdown in the economy lets you show how vital IT is to a profitable business.

ALLAN E. ALTER

Using Yesterday To Help Guide Your Tomorrow

IF YOU'RE LIKE ME, one of your holiday traditions is sitting in your favorite chair, sipping hot chocolate and raising your blood pressure by reading the year-in-review articles. This year's mélange of essays picking apart the dot-com meltdown and the possibility of recession succeeded at raising unpleasant questions.

But if it's answers you want — especially on how the New Economy might rebound from the current state of affairs — it was hard not to come away disappointed.

Most of the articles I read either retold tales of dot-com layoffs and closings, reaffirmed the importance of profits, cash flow and other business fundamentals, or buried readers in contrary statistics before concluding with a hearty "only time will tell." Not much help. Nor was I enlightened by the optimists who assured us that the forces of the New Economy are simply too powerful to stay down too long. What will it take to lift it up again?



ALLAN E. ALTER, a former *Computerworld* editor, is editor in chief of the *MIT Sloan Management Review*. Contact him at altera@mit.edu.

What seems to be in short supply are ways to think through and apply the lessons of the past year. Consultants and professors call these constructs "frameworks," and although they often do little more than restate the obvious as 2-by-2 matrixes, the best of the breed can help decision-makers think through options and choose the best ones. Such tools can guide the thinking of entrepreneurs and strategists and help them avoid the kind of ill-conceived business models that caused so many companies to crash last year, spooking the stock market and venture capitalists and contributing to the slowdown we now find ourselves in.

What kind of frameworks would I like to see?

Let's start off with analyses that retrace the steps taken by successful, middling and unsuccessful e-businesses during the past few years. We've now had enough experience, both with dot-com start-ups and the so-called established bricks-and-clicks companies, to understand how they got to where they are now. It's time we went beyond dot-com death lists and the same tired success stories. Instead, I'd like to see analyses that look for patterns in recent business history and present them as options for e-businesses to choose as they grow, evolve and face changing business conditions.

I'd like to see frameworks that help businesses think about "information behavior" — how people work with information and what they do with it. As author Tom Davenport has pointed out, users frequently disregard systems that IT professionals create because they don't consider information behavior. Similarly, people creating businesses that depend on the capabilities of the Internet need to analyze the attitudes behind their customers' information behaviors. Perhaps if they did, so many wouldn't have placed such big bets on business models that relied on banner ads.

Perhaps hardest of all, we need help in uncovering and testing our assumptions. Under what conditions are our thoughts about consumer behavior, trust, and motivation valid, and when are they not? Business models are always based on such assumptions, and executives should test these assumptions before adopting them. For example, we're seeing a rush of interest in wireless technology — supposedly the next great technological wave. Before rushing out, e-business leaders should identify and check their assumptions before betting on what might turn out not to be a gold rush after all.

Dot-com death lists may be morbidly amusing to read, but they won't help your company stay off them down the road. That's why we need to read fewer descriptions and more prescriptions.

READERS' LETTERS

Individuals, Not Auction Sites, Are Responsible

BY PUTTING the responsibility for transaction integrity on online auction providers, the Business Software Alliance opens a path to where these sites must financially qualify buyers and sellers ["BSA Proposes Software Piracy Guidelines for Online Auction Sites," *Computerworld.com*, Dec. 13]. The responsibility for ensuring the integrity of a transaction belongs to the individual, not the auction site.

By the way, eBay's User Agreement has the appropriate terms: "Our site acts as the venue for sellers to list items (or, as appropriate, solicit offers to buy) and buyers to bid on items. We are not involved in the actual transaction between buyers and sellers. As a result, we have no control over the quality, safety or legality of the items advertised, the truth or accuracy of the listings, the ability of sellers to sell items or the ability of buyers to buy items."

Marcel Guerin
Houston

SCM's Ugly Stepchild

THE ARTICLE "Supply-Chain ROI Is Elusive" [Page One, Jan. 1] was informative. The ugly stepchild of supply-chain management, the invoice-to-cash process, is also difficult to manage, with exceptions (pricing errors, damaged goods, etc.) occurring in 8% to 15% of all B2B transactions.

Most enterprise resource planning systems aren't equipped to handle these issues cleanly.

Thomas Denk
ChiCor Inc.
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tdenk@chicor.com

Answering IT Threats

IN "BUSH EYES Overhaul of E-Security" [Page One, Dec. 18], Ken Watson hit the nail on the head. Without jurisdiction or ownership of the infrastructure, federal response to IT and communications infrastructure threats will always be too little, too late.

A better approach would be an organization of civilian volunteers holding key positions in the IT and communications industries. A digital civil defense has the advantage of reaching out to the very people most threatened by a cyberattack. Enlightened self-interest would ensure a high degree of participation. After passing a background check, volunteers could be provided with intelligence and tools to prevent or counteract known attacks. A volunteer organization would provide a more flexible and effective response than a heavy-handed federal agency and would raise far fewer civil liberties concerns.

John Mellen
Wilmington, Mass.

Missing the Boat

THE ARTICLE "Exchange May Cut Ocean Shipping Costs" [News, Dec. 11] cites criticism by transportation analyst Donald Broughton that this effort has little worth because it doesn't cause the freight to move faster. The point of any IT effort is to simplify the process and reduce costs. Broughton's statement is analogous to an overland shipping analyst not welcoming a reduction in fuel prices or toll fees because it doesn't make the trucks go any faster.

Sam Stone
True Solutions Inc.
Norfolk, Mass.

Column Appreciated

THANKS FOR highlighting Hadassah-Hebrew University Hospitals ["From Israel, a Familiar Story About IT," News Opinion, Jan. 1].

Like many U.S. medical institutions, it faces many challenges. Unlike U.S. hospitals, it is supported by the hard work of women across the world (in fact, Hadassah is the largest women's organization in the U.S.). And unlike U.S. hospitals, Hadassah treats thousands regardless of race, religion or financial status. It is a real success story both for the Hadassah women who support it and the doctors, nurses and other medical people in Israel.

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COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax (508) 879-4843. Internet letters@computerworld.com. Include an address and phone number for immediate verification.



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JOHN GANTZ

Despite Crash, E-Commerce Will Still Flourish

DOT-COM STOCKS may not come back for years, but that doesn't mean the boom in Internet commerce won't continue. E-marketplaces may be consolidating faster than water in subzero weather, but that doesn't mean the boom in Internet commerce won't continue. By some counts, almost 40,000 jobs were lost in the dot-com sector last year, but that doesn't mean the boom in Internet commerce won't continue.



JOHN GANTZ is a senior vice president at IDC in Framingham, Mass. Contact him at [illegible]

Are we clear on this yet?

For the past six months — since it became obvious that Internet stocks were in a tailspin — I have been asked whether IDC would change its forecast for Internet commerce, which I have a hand in producing. The answer has been — and remains — no. Since our forecasts are based on demand — what companies and consumers will spend over the Internet — and not supply, the forecasts are only peripherally related to the fortunes of individual commerce sites and even less to the valuations that speculators put on individual companies.

So we still think that more than 100 million people will become Internet users this year (mostly outside the U.S.) bringing the total to 450 million, and that Internet commerce will double to more than $500 billion (mostly business-to-business). This increased access and growth is the result of investments made by companies and governments over the past five years. A minor event in the financial markets, such as a drop in the stock price of Yahoo or Priceline, has little to do with those past investments bearing fruit.

Other drivers of global Internet commerce growth range from falling telecommunications prices and cheaper servers and hardware to government initiatives in Europe and Asia. And this year, a wave of small businesses will catch up to their larger counterparts in implementing e-commerce. So, all told, the vital signs for growth remain strong.

There's a three-pronged message here for IT professionals:

1. While jobs may have been lost in the dot-com sector, there will still be a rapid growth of Internet-related jobs among brick-and-mortar companies. So, if you're a manager, your staff will still be heavily recruited.

2. There will be no letup in demand to connect back-end systems to your front-end commerce sites. This includes the complex task of tying in to the e-marketplaces in your industries.

3. With most of the growth in access and almost two-thirds of the growth in commerce coming from outside the U.S., the importance of Web site localization will increase. This will put pressure on IT organizations to rationalize major applications across geographies. And don't forget all the other technical issues, from keeping the Web site and its back-end systems going to ensuring privacy and security.

In one aspect, the dot-com crash will affect the average business. You may lose an account rep or customer service contact, or even one day find the phone disconnected or the lights out at one or more of the many suppliers you rely on for e-business services, hardware and software. This depends on how much of their business was coming from well-heeled start-ups (or if they were dot-coms themselves).

But alternate sources exist. You just have to look harder to find them. ▶

BILL LABERIS

How to Lead When Leaders Are Needed

I BELIEVE I'VE READ every magazine article and popular book on what makes a great manager/corporation/CIO/ leader — take your pick. I managed some of the most challenging employees of them all (journalists) for 12 years. And I have carefully observed the good, the bad and the ugly of IT management for 20 years.



BILL LABERIS is a consultant in Holliston, Mass. and former editor in chief of *Computerworld*. Contact him at [illegible]

Leadership is never more important than in increasingly uncertain economic times — like today. The eyes of the masses turn to the boss for confidence, solace, direction and support. So here's the distillation of a lot of great thought (mostly someone else's) on the makings of a sterling IT leader:

Advocate for polite applause. It's always great getting some sort of "attaboy/attagirl" from the boss, but when was the last time an individual in IT got accolades from the boss's boss, or others in non-IT management? When a job well done by the network administrator gets rewarded with a personal note or a gift certificate from the CFO or division president, it's an amazing morale booster. The CIO can and should regularly advocate for such extradepartmental kudos. They'll become proudly displayed, badge-of-honor wallpaper for cubicles and office walls.

Advocate the value of IT. Over the holidays, my nephew, a network administrator, showed me a video he made at work as part of an office contest. It was a comedy featuring the IT department and help desk. He said it got a lot of laughs at work since it reinforced many of the widely held Dilbertesque views of IT. That's so ironic in a day when corporate titans like Charles Schwab and GE's Jack Welch state over and over that their companies' fates are inextricably linked to their IT strategies. The CIO should take the lead role in forever dispelling the notion of IT as a whipping boy and laughingstock. The best CIOs spend time as their departments' public relations agents, regularly meeting with small and large groups throughout the company to beat the IT drum and extol the successes and challenges IT faces.

Be seen and heard. Many, if not most of you, have an office with walls and a door. Did you ever ask why?

During three years as a manager of 75 people, I morphed my personal workspace from a traditional office first to a fishbowl literally in the middle of the department with four glass walls and no curtains, and second to a wide-open space with no doors or walls at all, save the exterior wall. I did the same for all other managers, then sprinkled a few conference rooms throughout the floor for private conversations. Personal contact with the staff more than doubled. Anyone and everyone stopped by to talk about anything and everything. It's hard to quantify, but my knowledge and understanding of the most critical assets I managed and of the factors that motivated them increased dramatically. So tear down the walls, literally, and be seen and heard. They are a piece of the past that you no longer need.

Make your motto "Nothing recedes like success." In other words, institutionalize change as a permanent fixture of life in the IT profession. This of course should be a corporate mantra, but it has to start at the departmental level, and that means the CIO becomes the agent of constant and continuous change within IT. Done properly, change happens in an almost evolutionary way. That is, almost no one notices from week to week. But the CIO can review procedures, methodologies and other candidates for constant change and improvement every six months and on an annual basis, pointing out the changes made and the resulting benefits. Being resolute about institutionalizing change can be both the simplest and the hardest thing you do, because most people just don't like it.

The world's best managers practice and endorse these routines. None of this is hard, and that's the beauty of this collective wisdom. ▶

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- **Jerry Thode** Vice President, Cap Gemini Ernst & Young

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- **Jeff Cole** Professor, Anderson School at UCLA
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BUSINESS

SECURITY CHALLENGES

The IT operation at Israel Aircraft Industries, Israel's largest company, faces plenty of challenges. The unit must support IAI as it seeks to develop products and services that will appeal to demanding customers beyond Israel's borders. But it also must make security its highest priority, because security underpins everything the company does. ▸ 34

A HIGHER CALLING

Mark Cyr is far from your typical IT leader. As the IT manager at the Episcopal Diocese of New York, the Rev. Cyr says he uses technology to help "spread the word of the Lord." ▸ 34

FUZZY MATH IN WASHINGTON

Doo't bank oo the oumbers the federal government uses in measuring the impact of IT on the natioo's economy, writes Paul A. Strassmann. Why oot? Just take a look at how Washingtoo measures its own budget increases for hardware and software. ▸ 38

FLYING HIGH

Forty cities in 20 weeks. The rigors of that grueling work travel schedule are still fresh in Phillip Buntoo's mind. But so are the rewards he reaped as a result of years' worth of travel for various IT jobs. With an average of 75,000 frequeot flier miles a year, Bunton says he and his wife have been able to live it up in some exotic locales. ▸ 38

BEHAVIOR PATTERNS

It's hard to be too choosy in a tight labor market like today's, but in order to bome in on a job candidate's true workstyle, many employers are turning to behavioral interviewing. The process focuses on how employees have behaved in particular situations, rather than just looking at what their skills are. ▸ 42

GIRLS AND TECHNOLOGY

A recent Arthur Anderseo study found that not a whole lot has changed over the years: Boys still show a strong interest in technology and busioess, while girls set their sights oo careers in teaching and health services. But, says Kathleen Melymuka, the reasons girls give for why they're turned off by corporate IT are exactly the reasons why they would make great IT leaders. ▸ 44

QUICKSTUDY

EBITDA (earnings before taxes, depreciation and amortizatioo) is a widely accepted indicator of a company's financial performance. But to many, it's simply an accounting gimmick used to dress up a company's financial picture for Wall Street. ▸ 45

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THE COMEBACK KIDS OF IT

WHEN THE DOT-COM PINK SLIPS started showing up, it was a shock to many IT professionals who thought they had landed their dream jobs. But when they started looking around for new jobs, displaced IT workers say they realized they had walked away from the start-ups with better business savvy and job-hunting skills.

40

National Security Issues Hamper Customer Care

Israel Aircraft's IT seeks to balance links with customers, need to control threats

BY MARK HALL AND PIMM FOX
LOD, ISRAEL

ISRAEL AIRCRAFT Industries Ltd. (IAI) takes security seriously. Its headquarters, set behind high chain-link fences topped with razor wire, is patrolled by a private army of Uzi-toting guards.

With more than $2 billion in revenue and 14,600 employees, IAI is Israel's largest company. Despite being run by the fractious and socialist-leaning Israeli government, the company is charged with making a profit each year. That puts pressure on IAI to develop products and services that will appeal to organizations outside the nation's borders. As a result, the company exports goods to more than 90 countries, and exports represented 80% of its sales in 2000.

But for MAMAN, as IAI's IT department is known, the obsession with protecting corporate assets makes it much more burdensome to look outside its base of government customers to improve commercial relations.

"The fundamental and inherent interest of our company is the well-being and security of Israel," said Yoram Holtzberg, deputy general manager of MAMAN. And given the political realities of the region, that makes security uppermost in IT managers' minds as they embark on new programs, such as customer relationship management (CRM) and outsourcing.

A Competitive Edge

MAMAN's staff of 240 supports four business divisions with more than 10,000 end users. Each division has a variety of profit centers, and MAMAN must offer competitive IT support because it charges back its services to business units within the divisions, which have the option of seeking outside IT services to hold down their own costs.

"We have to sell ourselves," Holtzberg said. "Nothing is guaranteed."

MAMAN must help IAI stay competitive enough to attract and satisfy demanding customers, Holtzberg said. So, he explained, when customer calls were left unanswered due to Sabbath restrictions, an IT problem unique to Israel, MAMAN had to be prepared to make changes.

According to Vivian Meyerowitz, the company's CRM project manager, "There are a lot of religious people at IAI. Giving customers online access to information became important because phone calls went unanswered [on the Sabbath]."

Introducing a CRM program wasn't as easy as it might be in most companies, however.

When the avionics division cuts a deal to upgrade, say, Turkish or Chilean jets, those customers expect to get access to information about the status of work. To permit outside access, Yosef Yakovich, IAI's manager of communication systems and networks, had to design a parallel network running a variety of applications on servers that run Sun Microsystems Inc.'s Solaris, Hewlett-Packard Co.'s HP-UX or IBM's AIX.



Yoram Holtzberg



Yosef Yakovich

These applications have to be synchronized to the main network through what MAMAN calls its "demilitarized zone" (DMZ). This DMZ lets users connect to the latest data on the parallel network while systems within the DMZ check all files, data and users for security, looking for viruses, double-checking user authentication and deflecting attacks from outsiders before passing along information requests or file updates to the primary servers.

Despite the recent bout of violence in the Middle East, Yakovich said that direct attacks on IAI have remained "approximately the same as two or three years ago." However, he wouldn't provide specific numbers.

Outsourcing some procurement operations involved similar security precautions, according to Eyal Hollander, business-to-business product manager at The Ring, IAI's application service provider. Hollander said the company established what it calls a "cow gate" between The Ring, a division of Tel Aviv-based telecommunications provider Bezeq, and its electronic data interchange system. The cow gate ensures that only one transmission — incoming or outgoing — occurs at a time, so each can be thoroughly checked for any security problems.

Future Hurdles

Holtzberg said that although he's pleased with these successes, he understands that big challenges remain for his group to compete for IT services at IAI. Holtzberg pointed to the need of giving more suppliers access to engineering databases to expand and improve business-to-business services.

But Richard Aboulafia, director of aviation studies at Teal Group Corp., an aerospace and defense research company located in Fairfax, Va., said IAI still has a long way to go.

"There is nothing more difficult than a vertically integrated business that doesn't view its business units as profit centers," he said. "At the subcontractor level — and this may be the IT support — they tend to view the prime contractor as a free lunch, a free ride."

"I would say that IAI is about 10 to 15 years behind American defense contractors in terms of entrepreneurial zeal," Aboulafia added.

SOUND BYTES

Finding a Higher IT Calling

Not all IT leaders head up cutting-edge e-commerce operations or Fortune 500 IT departments. Some want to use the Web for a different kind of success.

The Rev. **Mark Cyr**, 44, for example, spent the past seven years helping to build Christ Church in Warwick, N.Y., into a growing and thriving congregation. He did this, in part, by developing a Web site for the parish (*www.christchurch.org*) in late 1995 as part of his ongoing efforts to help "spread the word of the Lord."

After discovering that only a handful of parishes in the Episcopal Diocese of New York provided any outreach via the Internet, Cyr pushed for more modernization, an effort that eventually landed him a job this past November as the diocese's IT manager. Cyr is now responsible for technology activities for 210 parishes in parts of New York City and the lower Hudson Valley.

Computerworld's Thomas Hoffman asked Cyr what led to his latest calling and what he hopes to achieve in his new position.

How did this opportunity come about? I've been using computers for 15 years, starting with a Tandy 1000, but it was just a sideline to help me get through seminary school, write sermons and church newsletters. When I became rector [at Christ Church in September 1993], I joined the Warwick Valley PC Users Group to help me get out of the house. In 1995, I built a Web page for the church using Notepad, and that opened up a whole new avenue to get the word out. I then turned my attention to creating a Web page for the Episcopal Diocese of New York.

It turns out that other groups in the diocese weren't onboard with sending me information that I could post on the site, so I pushed for that. Then 18 months ago, the diocese created a committee to find a new director of communications, and I gave some suggestions on other Internet initiatives. This brought about an increased sense of the need to beef up the diocese's Internet presence. After the [previous] IT manager left this summer, I expressed an interest in the job.



THE REV. MARK CYR gave his parish its own Web site.

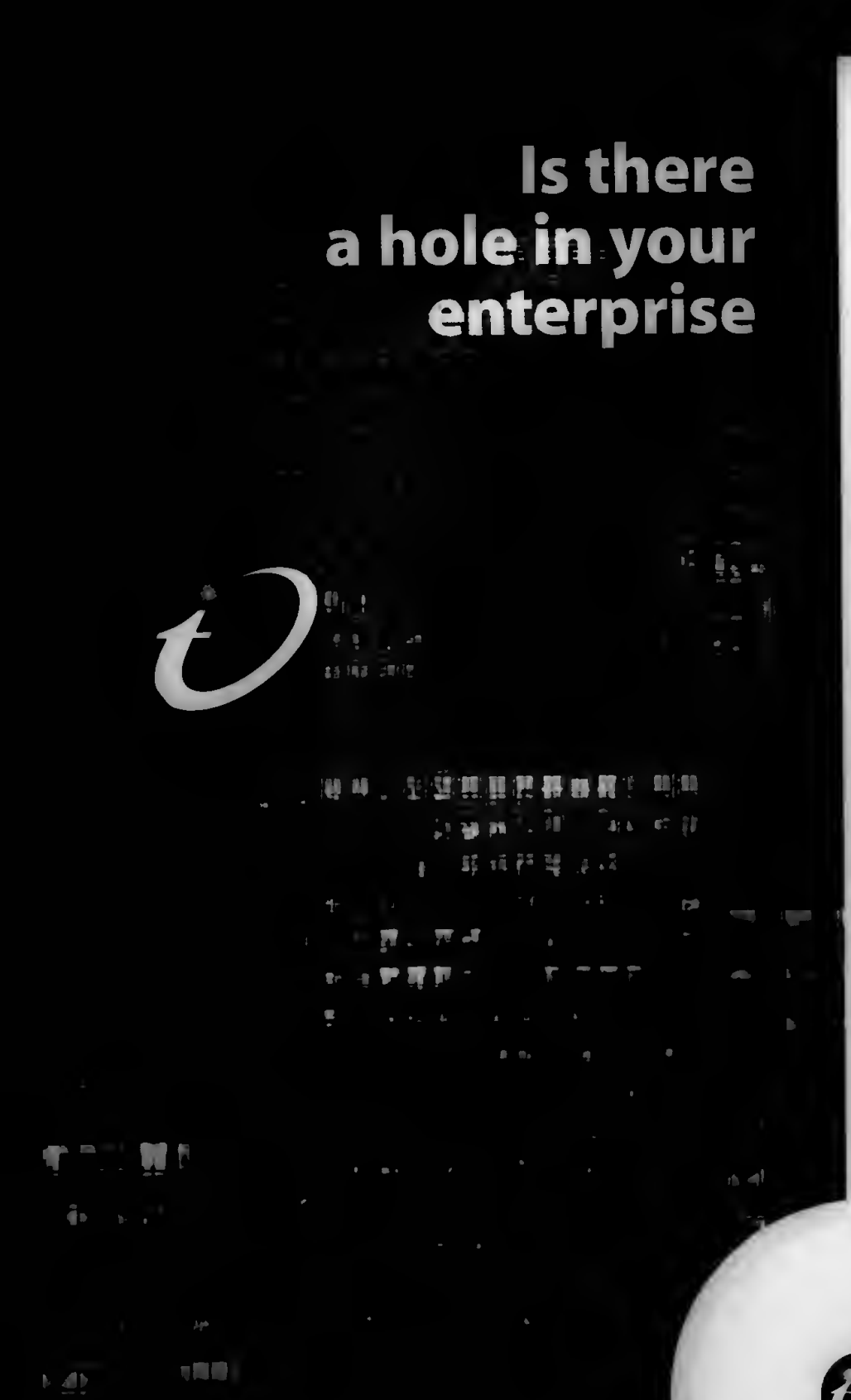
What are your goals? The first goal is to get our new LAN up and running. Then, it's to teach our staff how to use what's on their desks. We have about 30 folks in Manhattan between two office buildings.

Also, the parishes have generally been slow to get onboard. Of the 210 parishes in the diocese, only 60 are online. Most are small parishes that are struggling financially. So one of my long-term goals is to build an endowment to fund technology for the diocese.

Did the decision to move from pastor to IT manager take some soul searching? Seven years is the average tenure of a rector in a church. I felt like it was time to move on, to explore different avenues. I'm more of a team player – being a rector is more of a solo position. But in the end, it's really just a different pulpit.

In the Middle Ages, the printing press was a turning point for churches to spread the word. There's no reason why the same thing can't happen today with the Internet. Most mainline Christian denominations are struggling to attract new and young members. The ones that are succeeding are the ones using today's technology.

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WORKSTYLES

Uncovering a Worker's Paradise Amid the Friendly Skies

For many, traveling for work is anything but exciting. It can be downright grueling. But some of the most experienced road warriors manage to take their frequent-flier miles and turn their travails into pleasurable journeys to the distant corners and sunnier climes of the globe. One such sojourner is Phillip Bunton, vice president of sales and marketing at Entrinsik Inc., a provider of knowledge management software and services in Raleigh, N.C.



What It's Like To Work at...

In years past, Bunton was extremely busy hitting the circuit for his employers, former e-mail application provider Da Vinci Systems Corp., and then Cary, N.C.-based asset management application maker Tangram Enterprise Solutions Inc. He was able to apply his many miles on two trips to Jamaica, one for his honeymoon and the other for his five-year anniversary. He also got a free trip to Japan out of his long hours on the road.

How hard did you have to work for those frequent-flier miles? Novell had this show where several vendors would give speeches, and I was one of the speakers: 40 cities in 20 weeks across the nation. For about three years in a row with [Da Vinci Systems], I traveled and earned around 75,000 miles each year. Later, as a channel sales manager for [Tangram], I went coast-to-coast traveling all week, traveling about 80,000 miles a year for two years.

It was just assumed that frequent-flier miles were a well-deserved perk for road warriors or anyone else who had to travel. My wife, of course, enjoyed the perks that my points allowed us to take, but I think if you were to ask her, she would tell you it's definitely *not* worth it.

Why did you go to Jamaica and Japan? I chose to take my wife to Jamaica on our honeymoon five years ago. We stayed at this all-inclusive resort, where you had your own apartment in a duplex – all the food, booze and activities were included. We saw Dunn's River Falls, took a catamaran cruise, went cliff and scuba diving and took a horseback ride in the Blue Mountains where they make that famous coffee. It was all so incredible.

The Japan trip was January 1998. We stayed for three weeks, through an incredible snowstorm, but got to see the Great Buddha temple and several Shinto shrines and toured some incredible architectural wonders in Tokyo and Yokohama. We partied with the locals in the famous Roppongi district in Tokyo and got ringside seats for the equivalent of the national championship of sumo wrestling.

What were some of the more unusual things you encountered on your trips? In Japan, we got stuck in one of the worst blizzards that Tokyo had ever seen. What should have been a two-hour trip ended up being 13 hours on a school bus. We nearly had to commandeer the bus to stop for food.

We [later] went inside the brass [statue of the] Great Buddha. It was hollow and really amplified your voice. Little did we know there were about 60 kids standing outside on some kind of school field trip. Well, our voices came out incredibly loud, and these kids thought their Buddha was speaking English and it scared them.

We caused a spectacle in downtown Tokyo one night when my wife, who is 5 feet 11 inches, bought a pair of 8-inch-sole boots. Some women were quite offended, and one told her that Americans were "blessed with enough height" and we should not make fun of those less fortunate.

Do you have any idea how much money you saved by using frequent-flier miles? The first-class tickets to Jamaica for the honeymoon were about $800 each. We took coach last September for the five-year anniversary and those were only $300 each. Japan was $2,200 a ticket.

– *Marc L. Songini*

PAUL A. STRASSMANN

Fuzzy Math in D.C.

I FIRST LEARNED OF THE federal government's "hedonic" evaluations of IT budgets during budget reviews in 1992, when a Pentagon financial examiner noted that the Defense Department's requests for 5% annual increases in IT spending would actually be 22.8% in the first year and much more in following years. Such large jumps, the analyst suggested, would be unacceptable.

I checked the math. It was numerically correct. The large gains were generated on the basis of tables (see chart) from the U.S. Department of Commerce's Bureau of Economic Analysis, so that the 5% for 1993 became 22.8% after adding a 17.8% implied annual cost reduction. The White House evaluated IT spending using "inflation-adjusted" comparisons. So a proposal for 5% salary increases would be OK because it matched the government's official "inflationary index." But proposals for computers were different, using a "hedonic deflationary index." This would boost the worth of computer hardware above its cash costs using the numbers indicated on the chart below.

Hedonic, derived from the Greek language, means "of or pertaining to pleasure." My budget examiners told me that "hedonic" was an economist's way of saying that customers would be deriving more pleasure from equipment that's better and cheaper to purchase. Checking the supporting data, I found that government economists used a mix of declining wholesale prices for desktops and laptops, plus unit costs of disk memories and printer performance statistics, to come up with indicators that reflected the decreasing cost and increased performance of hardware. So a 700-MHz desktop costing $3,000 would actually be twice as good as a 350-MHz desktop purchased for the same amount.

To understand how a hedonic deflator works, consider its consequences. Take a budget request of $1 billion in 1997 and $1 billion in 1998.

YEAR	HEDONIC DEFLATOR	IMPLIED ANNUAL COST REDUCTION
1990	3.077	N/A
1991	2.791	-9.3%
1992	2.364	-15.3%
1993	1.944	-17.8%
1994	1.696	-12.8%
1995	1.395	-17.7%
1996	1.000	-28.3%
1997	0.710	-29.0%
1998	0.469	-33.9%

With the aid of hedonic deflators, Department of Commerce economists would say that the $1 billion is actually worth $1.41 billion ($1 billion divided by 0.71) in 1997 and $2.13 billion ($1 billion divided by 0.469) in 1998, compared with the $1 billion spent in 1996.

There's no way an IT executive can respond to such logic, because it's flawed. Theoretical calculations of improved computer performance don't translate into IT budgets. Moore's Law works in electronics, but not in budgeting. Rising IT spending can't be judged simply by tracking catalog prices and hardware performance claims.

IT spending assessments that rely on deflationary cost indexing are used chiefly in the public sector, but this simplistic idea will certainly appeal to someone with an MBA, especially if he's told to find a rationale for cutting IT expenses. As IT budgets exceed 20% of the salaries of information workers, and total IT support costs exceed the median of U.S. manufacturers' profits, there will be more temptation to use government-approved hedonic deflators as a whip on the IT organization when the next recession hits. IT leaders must understand the fallacy of such measures before dealing with inquiries on why well-advertised cost reductions don't show up as decreased costs or bigger benefits.

Deflationary indexing isn't only a means for analyzing corporate budgets; it's also a clever way to manipulate whatever candidates claim in an election year. Recent boasts by the Clinton administration that IT has contributed one-third of U.S. economic growth are misleading. The numbers in the widely quoted Department of Commerce publication *Digital Economy 2000* are biased because the IT sector's output was enlarged by hedonic indexing while the contributions of long established industries were shrunk because they were adjusted downward.

IT leaders should be careful in citing enormous nationwide productivity gains in case someone applies similar misleading metrics to their own firms.

Strassmann (paul@strassmann.com), formerly director of defense information at the U.S. Department of Defense, has defended large IT budgets and prefers to answer questions in terms of cash, not synthetic numbers. For details, see www.infoeconomics.com/005.


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Recove

After the Shake

LAST MARCH, Michael Berch, a 44-year-old former Unix systems administrator, took a position which, in many respects, would be an IT worker's dream job. In addition to a six-figure salary and 25,000 stock options, Berch was granted a shot at becoming a vice president and doubling his 17-person staff by year's end. His employer, Oak Ridge, Tenn.-based Internet Pictures Corp. (iPix), which features online virtual tours of real estate properties, was a "darling on Wall Street" at that time, he says.

But it was only a matter of time before Berch joined the ranks of laid-off dot-com workers.

The iPix downslide began last April, when its stock tumbled along with the rest of the Nasdaq Stock Market. The company's share price dropped from $40 in April to $10 in June. In spite of the decline, iPix workers remained optimistic about their future at the company. "Everyone kept up a good face for the first two months" after the tech stock bubble burst, Berch recalls.

But as summer wore on "the atmosphere suddenly changed," as the company failed to raise the anticipated capital from a second public stock offering, he says.

Finally, in October, Berch learned that he would be one of approximately 200 employees — about 20% of iPix's staff — who would lose their jobs.

A Silver Lining

The dot-com shakeout may have been a scary ride for Wall Street investors, but displaced IT workers say they were able to walk away with better business savvy and job-hunting strategies, as well as a better understanding of what to expect from their employers.

At smaller companies, IT professionals typically have greater exposure to other areas of the organization, such as marketing, finance and human resources, says Kazim Isfahani, an analyst at Giga Information Group Inc. in Cambridge, Mass. IT workers at start-ups have also come away with a better understanding of how to marry IT with business strategy.

"The ideal [job candidate] possesses business savvy and technical ability. They're not a dime a dozen," Isfahani says.

Berch was just one of more than 5,000 dot-com employees who were handed their pink slips in October, according to Chicago-based outplacement firm Challenger Gray & Christmas Inc. A total of 22,267 jobs have been eliminated from dot-com companies between December 1999 and October of last year, according to Challenger.



ering out

Start-up castaways walk off with better business savvy and more marketable skills.

By Julekha Dash



Berch and other IT workers say they now know what kind of questions to ask potential employers.

Berch, for one, says he would examine a start-up company's funding prospects more critically. For instance, if a company has plans to expand, he would ask the principals if they have the money to make it happen. And, he says, regardless of whether he works for a dot-com or a brick-and-mortar firm, he would question whether promises are likely to become realities. "If I'm told that I'll be a vice president or can expand my department, what factors will make that happen?" says Berch.

Tougher Questions

Allison Hemming, who runs The Hired Guns, a New York-based consulting firm, says IT workers who were dismissed from dot-coms will ask tougher questions the next time a new venture presents itself. These include questions about senior management's experience and when the company expects to become profitable — rather than the technology-related questions that many technologists had mistakenly focused on, she says.

Hemming hosts monthly "pink slip parties," at which former dot-com workers and recruiters are invited to mingle in a Manhattan bar. Attendance at these events has grown more than tenfold — to more than 300 people — since Hemming launched them last July. While the proportion of IT workers to recruiters at these events is still relatively low, Hemming says, "it's the first time [IT workers] are being proactive" with their job hunting since the dot-com crash began, because competition for top jobs is higher than ever.

Not surprisingly, many IT workers say they see more value in an attractive salary than in stock options. "If I don't get the money and freedom to do what I want, then it's not a place where I belong," says Stace Carter, who worked at online retailer Value America Inc. in Charlottesville, Va., for two years until he was laid off at the end of 1999. The company subsequently filed for Chapter 11 bankruptcy protection last August.

"The market is not something to pin your retirement on," says Carter, whose duties at Value America ranged from strategy to programming and Web design.

Working at a start-up also taught Carter, who is now a multimedia producer at Heninger Media Services in Charlottesville, Va., how building relationships can lead a company to success and add value to clients. "These days I [contact] colleagues who were not so long ago considered competition but provide complimentary services," he says.

Marguerite Payne, who was released from her job as a project manager at License Online Inc. in Bellevue, Wash., in September, says she would still consider working for a start-up but now knows to ask tougher questions of a potential employer, such as the status of its funding, what options the company has if it doesn't go public and its forecast for profitability. Payne began working at License Online, which supports online licenses for Microsoft products, in November 1999.

More Business Savvy

During his time at iPix, Berch learned how to negotiate vendor relationships and set up service-level agreements, which included some quantitative analysis. For example, if the network or help desk were down 1.2% of the time, how much money could the company potentially lose? In addition, Berch says he learned how IT expenses impact the bottom line. How much does he have to spend on equipment and people to process one real estate virtual tour?

Though Carter says the constant pursuit of venture capital made life at a dot-com insecure, making presentations to potential investors "where the stakes are high" nonetheless proved to be one of his most valuable experiences. "It's put me in good stead in other client meetings or job interviews," says Carter. "I'm more comfortable talking a $50,000 deal with a client. Those numbers don't scare me anymore."

Since Carter worked closely with Value America's former chairman, hiring managers and recruiters often want to tap his brain to find out what mistakes the company's senior management made so they don't repeat them. "They want to know how a company with $110 million in the bank can go bankrupt. Well, I have a list as long as my right arm," says Carter.

Customer Interaction

Last July, Darren Broemmer left his post as a senior technical architect at Fairfax, Va.-based American Management Systems Inc. (AMS) to join an online financial services company as a senior software developer. But after just five months, Broemmer was lured back to his former employer.

He originally left AMS after he became uncertain about the future of a project that involved developing reusable software components for Internet applications. Then, he heard from a former colleague at AMS that the project he had started would come to fruition after all, so he returned to AMS.

Broemmer says he walked away from the online firm with better business skills, which have helped him in his current job as a product manager, such as how to quickly incorporate customer feedback when developing a product. "One of the differences between large and small companies is that you have to be nimble and change quickly at a start-up," he says.

Joe Fuqua, senior principal at AMS and Broemmer's boss, says that developers with dot-com experience have had the opportunity to take on more complex projects.

"Even young workers [at dot-coms] are given fairly senior positions and put in a 'sink or swim' situation," says Fuqua. "People who survive that come out with a much expanded perception of what it takes to be successful." D

> "Everyone kept up a good face for the first two months [after the tech stock bubble burst]."
>
> MICHAEL BERCH, UNIX SYSTEMS ADMINISTRATOR

Oh, Will You



Many IT managers nowadays oeed ask potential hires only two questions:

What do you know?

When can you start?

Still, in spite of record-low uoemployment rates and record-high demand for IT personnel, that quickie conversatioo isn't in effect everywhere. At some corporations, hiring is still a complex and extensive process using a variety of techniques to select individuals who will be as right for the culture of the company as for the job itself.

At Capital One Financial Corp., for example, a candidate's development potential is as important as his ability to fill the current position. With an IT staff that has grown from 400 to 2,000 in four years, "we often look not only at what the persoo can do now, but what [he] can do in the next job," says IT recruiting director Jim Kutz, himself a hands-on IT manager just a few months ago.

Among the complex and interlocking methods used by the Falls Church, Va.-based credit card company are a series of behavioral interviews. These are a key part of the process, Kutz says.

What Is a Behavioral Interview?

John Madigan, IT human resources vice presideot at The Hartford Financial Services Group Inc. in Hartford, Conn., explains that a behavioral job interview is designed to reveal a pattern of behavior.

"We actually ask what you did in specific situations," Madigan says. "Concrete examples will demonstrate a persoo's preferred way of dealing with those situations and give you a better idea of that person and how they're likely to act on the job."

Madigan offers several examples of behavioral interview questions that might be asked of IT professionals with differeot levels of experience. For a lower-level employee, he might probe for competency and for teamwork skills: "Tell me about the last time you were asked to help out oo a project that you weren't directly assigned to." As follow-up questions, he suggests, "What was the project and what was your workload at the time? What did you do? How successful was your assistance, what impact did it have? Did you seek feedback oo your assistance, and if so, what was it?"

For interviewers who are trying to assess a higher-

BEHAVE?

Retaining your IT staff starts with hiring the right people in the first place. To do that, many companies are adopting the behavioral interview as a critical part of the process. By Judith Trotsky

level IT professional's ability to lead a team, be suggests questions along these lines:

"Tell me about a time when you were most successful in leading a group or team toward accomplishing an important goal." Then as follow-up questions, "What was the goal and who defined it? When did this happen? How were the steps leading to the goal defined? What was your role in implementing the process? How close did you come to meeting the goal?"

How Do You Do It?

Behavioral interviews should be a key part of every employer's hiring process, says Norman L. Scott, a senior vice presideot at Denver Associates Inc., a recruiting firm in New York. "What a persoo knows technically is secondary to who they are . . . and how they conduct themselves," says Scott. "Genius iso't all that counts. If the candidate is temperamental, can't listen and doesn't elicit the kind of behavior that makes people comfortable enough to work with him every day, be shouldn't be hired."

Defining your company and what the job requires are the first two steps, according to Jill Ellingson, assistant professor of managemeot and human resources at Ohio State University in Columbus. She says questions that IT job interviewers should ask themselves include:

"Is our culture disciplinarian? Is it autocratic? Autonomous?" And "Does our management team think employees should be an integral part of the decision-making process, or do we think employees should be at arm's length?"

Behavioral interview questions are good for all types of IT positions since they ask the candidate to describe his accomplishments and the work be has actually done. Of course, if the candidate describes ways be has used particular technical skills, it's difficult to ascertain his level of proficiency without further behavioral probing. Though not impossible, it's harder to get that type of information than it is to use behavioral interview techniques to assess "softer" skills like communication, negotiation and consulting abilities.

Once the company culture is defined, the next step is to identify the characteristics and competencies required. And then, explains Madigan, you'd want to ask behavioral-oriented questions that address those competencies.

For example, a candidate for a job in research-and-development management might be asked how be handled an unstructured project where there were no clear guidelines. The answer he gives would reveal his ability to deal with the ambiguity such a supervisory position often involves.

At The Hartford, the human resources department has compiled questions designed to elicit specific types of information and has posted those questions online internally. Managers can print out the questions for each competency they need. There are also specific online interview guides for positions that regularly need to be filled.

Capital One's Kutz describes his behavioral interviews as a series of who, what, when, where and how questions, such as: "Describe a project where you had to collaborate with others. How do you work in developing people? What steps would you take in trying to solve a problem like this?"

"Behavioral interview questions are very open-ended and deal a lot with, How did you do that? What exactly did you do? Why did you do it that way?" says Kutz. "We're really looking at how they think."

To be complete and accurate, behavioral interviews should be combined with other techniques. At Capital One, the daylong selection process follows two telephone preinterviews that probe behavior and technical knowledge. Survivors of this initial cut are invited in for a series of one-on-one meetings as well as personality, technical and business-problem tests.

"We really want to hire the best people," says Kutz. "By the time the process is over, the candidate will have conversations with five to seven people involved in the hiring decision. . . . We've got a lot of different views. It results in our hiring a better candidate."

Testing the Candidate

The profile for IT personnel is very much like the profile for marathon runners, says Douglas N. Jackson, president of Sigma Assessment Systems Inc., a personality test publisher in Port Huron, Mich. Above all else, IT work requires endurance, especially in the programming field.

Technology jobs also require logical, sequential thinking. However, too much of a good thing also can be true, asserts test creator Kathy Kolbe, CEO of Kolbe Corp. in Phoenix. The key to success for an IT team is to have a mix of people with the right instincts for the jobs they have and the right balance in terms of their approaches to problem solving.

While the criteria are complicated, Kolbe says she finds that people's instinctive approaches fall within the following general "action modes":

Fact Finders: precise, data-driven individuals who are able to see patterns and organize systems.

Quick Starters: people who have the ability to deal with the unknown and innovate.

Follow Thru: employees who excel at planning, designing and programming.

Implementers: individuals who are skilled in the use of tools and in hands-on, 3-D problem solving.

Kolbe says Quick Start behavior is a way of dealing with change. Interestingly, she notes that this is the instinctive style of most CIOs in this country. They're leading-edge and visionary, and their sense of time is the future.

That may be terrific, but — as in other personnel areas — a team with too many people with similar personalities could produce conflict — or equally destructive inertia. For example, if a group of programmers all want to hold off putting a system into effect until it's perfect, the project would never get done. ▶

Trotsky is a freelance writer in Staten Island, N.Y.

KATHLEEN MELYMUKA/DIVERSITY

If Girls Don't Get IT, IT Won't Get Girls

A RECENT SURVEY of high school students showed the top choices for both college major and career path are computer science and engineering — for boys, that is.

But technology barely shows up on girls' radar screens. Girls are five times less likely to consider technology-related studies in college or tech-related careers. They're still bent oo traditional female occupations such as teaching and health services.

These were among the troubling findings of a study commissioned by the Arthur Andersen GROW (Growth and Retention of Women) Project, which interviewed 500 girls and 150 boys ages 15 to 18 about their views on careers and success.

The students were overwhelmingly — and apparently equally — computer literate, with 85% of girls and 87% of boys taking computer courses this school year, and nearly everyone using the Internet.

But while girls said they understood the importance of computers to their future employment, they were anticipating careers in health services, teaching, art or music, not IT.

A look at the "whys" behind these findings shows that both corporate America and the technology community have beeo doing a lousy public relations job. As a result, girls think that what they're looking for in life and work can't be found in corporate IT.

For example, they said career success was about being personally happy and rewarded (28%), having the respect of family and friends (17%) and having a happy family life (13%). Only 5% mentioned having money.

"Success is not calculated by how many numbers are on your paycheck, but if you are satisfied with your job," said a girl in Chicago.

Their perceptions of life in corporate IT, however, seem to have beeo shaped by the comic strip *Dilbert*. "Corporate America is about money," said a New York girl. According to the survey results, girls equate moneygrubbing with corporate America and happiness with small business and public service.

"Given the fact that we're in the tightest labor market in 30 years, that's disturbing," says Karen Kurek, managing partner of Anderseo's GROW initiative.

Ironically, these girls sound like they're just the labor pool corporate IT needs most. The girls consider themselves leaders, so listen to their ideas on leadership: They were significantly less likely than boys to equate leadership with aggression, competition and winning. Instead, they defined good leaders as those who work well with others, have good morals, understand people's oeeds and help others to be their best. Sounds to me like perfect characteristics for IT teams and project managers.

"These girls need to get more education about what careers in IT and business are all about," says Kurek. "IT and corporate America need to let them know they can be happy and rewarded and be doing something socially significant in IT."

Anderseo has been sponsoring a 10-week after-school program in New York that gives selected high school girls the opportunity to learn about technology and business.



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The girls, in classes of 10, learn HTML and go on to create a Web magazine called *iPress* (*www.playing2win.org/gallery/syti2000/ipress/index/*). Then they create the content.

Each girl writes two articles. One is an essay on a social issue that she's researched on the Web. The other is an interview of a high-profile, successful businesswoman.

"They see women who are successful and get an ppportunity to see what it's like in the business world," Kurek says. Andersen is planning to expand the program beyond the Big Apple, she adds.

The good news is that high school girls' minds are still open. In fact, they're begging to be educated. More than eight out of 10 of the girls said they would be interested in learning more about careers in business, and that includes corporate IT.

When asked where they needed to see more female role models, the girls' top choice was in business, and girls from blue-collar and single-mother households — those least likely to enter IT-related professions — felt the need for business role models most acutely.

The IT community is importing foreign workers under the H-1B visa program while half the future labor pool in the U.S. is living under the illusion that you can't lead a fulfilling and meaningful life or make a difference for the better in the world while working in corporate IT. Moreover, they're asking to be shown that they're wrong.

This survey sends a strong, clear message to corporate IT: The ball's in your court. ◗

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Four Seasons Hotel, Toronto; Feb. 7-8
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Top-level strategies that will help turn your operatioo into a more profitable enterprise.
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How to make the knowledge workplace work for you.
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Information and real-world examples to help managers form strategic plans and implementations for computing.
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Chicago Marriott Downtown, March 19-21
Insights and implementatioo plans designed to foster customer-centric processes, leverage technology and enhance competitive advantage.
COST: $1,295 for Gartner Group clients by Jan. 22; $1,495 after Jan. 22; $1,595 for others by Jan. 22; $1,795 after Jan. 22
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EBITDA

DEFINITION

EBITDA stands for "earnings before interest, taxes, depreciation and amortization." A widely accepted indicator of a company's financial performance, the term is sometimes used interchangeably with "cash flow." However, its usefulness as a measurement tool is disputed.

BY SHARON McDONNELL

Increasingly popular in financial statements as a way to measure a company's cash flow, EBITDA has many flaws as a measurement tool and is actually quite different from cash flow, critics say.

EBITDA, which stands for "earnings before interest, taxes, depreciation and amortization," is a "fraud perpetrated on us by Wall Street — it's a joke," snorts Fred Hickey, editor of "The High-Tech Strategist," a Nashua, N.H.-based newsletter. "I don't think anyone should think about this at all. You should think about cash flow, earnings and sales; you can't just remove interest, taxes, depreciation and amortization."

EBITDA, which sounds like something Andy Kaufman's *Taxi* character Latka Gravas might say, can accurately measure cash flow if a company spends no money on debt interest or equipment purchases. More often, it's used as an accounting gimmick to dress up a company's financial picture to make it look rosier than it really is and deflect investor attention away from bad news, according to a report from Moody's Investors Service in New York.

While cash flow — the amount of cash left after money comes into and goes out of an organization during a certain time period — can't be gussied up to look like Cinderella at the ball, EBITDA is easy to manipulate by using "creative" accounting techniques for revenue, expenses and asset write-downs, according to the report "Putting EBITDA Into Perspective: The 10 Critical Failings of EBITDA as a Principal Determinant of Cash Flow" (see chart).

Corporate filings with the Securities and Exchange Commission often include terse warnings that EBITDA doesn't mean net income, doesn't measure liquidity and isn't part of the Generally Accepted Accounting Principles.

EBITDA "creates the appearance of stronger interest coverage and lower financial leverage," says Pamela Stumpp, senior vice president of corporate finance at Moody's and lead author of the report, which was released last July. "Earnings are not cash but merely reflect the difference between revenues and expenses, which are accounting constructs. Thus, it is important to scrutinize revenue recognition policies, especially for capital-intensive start-ups."

Where It Works

EBITDA is inappropriate for many industries because it ignores their unique attributes, according to Moody's. It's a poor measure of cash flow for companies undergoing a great deal of technological change or for firms that have short-lived assets (those lasting, say, three to five years) and need to keep upgrading their equipment to stay up-to-date. But it can be a valid measurement tool for organizations whose capital-intensive equipment lasts at least 20 years.

For example, the cable and media industries, which need to spend huge amounts of money to upgrade their technology, are ill-suited for using EBITDA, according to Moody's. So are industries that receive cash long after their earnings cycles have ended, such as the hospitality sector, which operates time-share resorts; Internet companies, at which barter often replaces cash receipts; and the trucking industry, in which trucks, whose value depreciates quickly, have to be frequently maintained before service begins to slide.

Then there's the technology industry.

"Along comes the Internet and, later, technology firms generally, [which] buy companies for huge amounts but amortize goodwill [the difference between what a company is valued at the time of purchase vs. the amount that is paid] — usually amortized over 30 to 40 years for companies with brick-and-mortar assets — over three to five years. This can make the earnings look 50% higher, even though the company's main asset leaves in the elevator every night," says Charles Hill, director of research at First Call/Thomson Financial in Boston, which analyzes earnings and forecasts. "It's making a silk purse out of a sow's ear."

A brief history: In the leveraged-buyout (LBO) mania of the 1980s, when many companies paid more than fair market value for assets, EBITDA became widely used to measure a company's cash flow — and thus its ability to service debt — by LBO sponsors and their lenders. (Prior to the '80s, earnings before interest and taxes, or EBIT, were used to measure a company's ability to pay its debts.)

> I don't think anyone should think about [EBITDA] at all.
>
> FRED HICKEY, EDITOR, "THE HIGH-TECH STRATEGIST"

Evolving Uses

Over time, EBITDA morphed into a measurement tool for cash flow at companies in "ocar-baokruptcy" mode, Moody's notes. Later, it was used to measure companies with long-lived assets such as steel furnaces and radio towers. Today, it's used by companies in all industries.

"Unfortunately, the use of EBITDA has evolved from its position as a valid tool at the extreme bottom of the business cycle — where it was used to assess low-rated credits — to a new position as an analytical tool for companies still in their halcyon days," Stumpp wrote in the Moody's report.

Of the 147 firms tracked by Moody's that went bankrupt in 1999, many of the U.S. firms borrowed cash based on their EBITDA, the report notes.

Livent Inc., a Toronto-based theatrical production company that filed for bankruptcy in late 1998, used to amortize huge preproduction expenses over a long time period in its EBITDA, despite running a high risk that those costs would never be recouped. In contrast, the EBIT for Livent — whose musicals included *Show Boat* and *Ragtime* — would have painted a truer picture of its financial condition, according to the Moody's report.

The greater the percentage of EBIT in EBITDA, the stronger the cash flow generally is, Moody's says. The higher the percentage of depreciation and amortization in a company's EBITDA, the more important it is that the company spends an amount equal to the depreciation value to keep its equipment current.

TOP 10 Critical Failings Of EBITDA

1. **EBITDA** ignores changes in working capital and overstates cash flow in periods of working capital growth.
2. **IT CAN BE** a misleading measure of liquidity (quick access to cash).
3. **IT DOESN'T** consider the amount of required reinvestment – especially for companies with short-lived assets, whether it's cable equipment or trucks.
4. **IT SAYS NOTHING** about the quality of earnings.
5. **IT'S AN INADEQUATE** stand-alone measure for a company's acquisition multiples.
6. **IT IGNORES** distinctions in the quality of cash flow resulting from differing accounting policies – not all revenues are cash.
7. **IT'S NOT** a common denominator for cross-border accounting conversions.
8. **IT OFFERS** limited protection when used in indenture covenants.
9. **IT CAN DRIFT** from the realm of reality.
10. **IT'S NOT** well-suited for the analysis of many industries because it ignores their unique attributes.

SOURCE: MOODY'S INVESTORS SERVICE, NEW YORK

McDonnell is a freelance writer in Brooklyn, N.Y. Contact her at Sharonfmc@compuserve.com.

■ *Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

Dear Career Adviser:

I'm a software developer in the Bay area with skill sets [that are] in demand: Java and C++. But my résumé looks terrible. I was with one company for three years and have been with three companies over the past two years. Joining a [business-to-consumer firm], I bumped my salary up by 30%. But then the next two companies I worked at folded. While I prefer smaller, New Economy-type companies, I don't want another fragile situation.

— JAVA JOE

Dear Java:

New York, Boston and the San Francisco Bay area are the nation's dot-com job centers, where new companies have risen and self-destructed at breakneck speed. But this doesn't mean the New Economy companies are dead, says Craig Newmark, founder of Craigslist.org, a community-building site list for major U.S. cities.

While you may have taken a particularly bad beating if you were at a consumer-oriented or consulting firm or an interactive agency, there are still tremendous opportunities if you want to stay at younger enterprises. Wireless, streaming media and even shopping are still being funded with venture capital and market support.

Nonetheless, before you jump into a new venture, ask the company these questions: How much cash do you have in the bank? Are you shipping the product? What's your "burn rate"? And how long will it be before you reach profitability?

Stay away from companies with revenues growing at 30% per year but whose head counts have annual acceleration rates of 350%.

Dear Career Adviser:

I have a master's degree in computer science and work for a software company as a programmer. I have an opportunity for a sales engineering job at the same company, and I want to know more about this type of job, its compensation and relevant lifestyle. How does this kind of job differ from a sales person's job or a developer's job?

— SE OR DEVELOPER

Dear SE:



FRAN QUITEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Sales engineering (SE) jobs are hot, particularly if you are an Oracle database administrator or work in networking, security, enterprise resource planning or wireless applications. Perched somewhere between salespeople who have direct quotas and developers who code and create technology, a good SE can be technically as strong as a developer, says Gene Magpayo, a sales engineering director at AppStream Inc., a Palo Alto, Calif.-based company that provides intelligent network-based computing on networked and wireless devices.

Serving primarily as the technical interface to closing sales, an SE's real strength lies in communication and in understanding the customer's environment and business problems and then showing how well a particular vendor's solution addresses them.

Furthermore, SEs have a sort of cross-departmental radar. They calibrate sales forecasts, advise sales personnel about whether a customer is real or not and communicate feature sets back to product development for future product enhancements.

Good SEs can earn base salaries of $90,000 or more plus substantial incentives, says Magpayo, but there are hitches. You must like travel, face-to-face presentations and working with people. Moreover, you must be unflappable and retain your sense of humor when Murphy's law kicks in to crash your technology during critical customer demos.

Dear Career Adviser:

I'm an IT security manager for a large government organization who is thinking about moving to a job in the private sector. I have elderly parents who live in another state who require increasingly more of my time and energy, including several instances where I needed to drop everything to help them. What should I tell a potential new employer?

— LOYAL LOUISE

Dear Loyal:

Provided you have worked for a least a year or 1,250 hours at a company with at least 50 employees within 75 miles, you can qualify for up to 12 weeks of unpaid leave under the Family and Medical Leave Act of 1993, which covers a variety of parent and child responsibilities.

Furthermore, your employer may require you to use any unused sick leave or annual leave as part of the 12-week leave provided by law, advises Izhar Matzkevich, co-founder and chairman of CaregiverZone.com Inc. in Emeryville, Calif., which provides information regarding many types of caregiving resources.

Since security is an around-the-clock commitment, particularly at the management level, focus your search on larger companies with fully staffed security departments that can support the workload in case of emergency. These larger firms are also more likely to offer employee assistance and work/life benefits, generally provided through companies such as Cigna Corp., Ceridian Corp. and Value Behavioral Health, among others. ▶

BRIEFS

B2B E-Commerce Protocol Launches

The New York-based American Arbitration Association (AAA) and some major industry leaders, including Microsoft Corp., AT&T Corp., DaimlerChrysler AG and PepsiCo Inc., announced last week a new business-to-business e-commerce dispute management protocol to help disarm conflict between buyers and sellers. This an educational wake-up call, and it will give practitioners the necessary confidence for online transactions to be successful, said William K. Slate II, president and CEO of the AAA, in a statement.

The protocol (http://www.adr.org) talks of fairness, continuity of business, use of clear management policies and the range of options for resolving disputes and commitment to technology.

PC Industry in Decline

Deloitte Consulting has issued a report stating that "long-term investor confidence in the PC industry has continued to decline with an improvement in sight." The report from Huntington Beach, Calif.-based consulting firm describes a 15% decline in its "hope index" in the third quarter of last year over the previous quarter, which reflects the lowest point that index has reached in five years, except for the third quarter of 1998. The hope index for that third quarter puts estimated returns on future investment, for two to five years, at PC companies at 18.5%.

i2 Tries to Boost B2B

To bolster the business-to-business supplier content for its Infinite Content business unit, Dallas-based i2 Technologies Inc. late last month said it has signed an agreement to acquire Trade Service Corp. and eContent Inc., the San Diego-based content divisions of Trade Services Holdings. The purchase price was $5 million and 2.3 million shares, according to an i2 spokesman.

B2B: Forecast Strong

This year, suppliers will become more willing participants in business-to-business e-commerce than last year, according to projections by The Yankee Group in Boston. Suppliers will work with buyers through collaborative e-commerce processes that include planning, scheduling, product development and product management, said Yankee Group analyst Lisa Williams. The transaction model of "pushing POs around" provides only marginal gains in efficiencies for sellers, Williams noted.

The Firm Formerly Known as Andersen

Chicago-based Andersen Consulting will now be known as Accenture. The rebranded organization will provide consulting services ranging from high-level strategic planning to improved customer service to day-to-day operations, according to the company.

The firm offers specialized consulting for customer relationship management, supply-chain management, finance and performance management. The renamed firm also offers outsourcing through the emerging Internet-based subscription model.

Yahoo Bans Items

Internet portal Yahoo Inc. has announced it will stop listing Nazi memorabilia on its auction site, as well as items associated with other hate groups. The change in policy comes after a French court ruled in September that Yahoo block sales of Nazi items in France, where they are illegal. The new policy will begin Jan. 10. Yahoo will also begin charging a fee for posting items of between 20 cents and $2.25, depending on the value of the item.

TECHNOLOGY

HACK OF THE MONTH

Computerworld security specialist Deborah Radcliff gives advice on how to stop spammers from clogging e-mail in-boxes and wasting IT staff time. ▸ 48

PROMISING SAN TOOLS

Analysts say software tools, such as three storage-area network (SAN) resource management packages released last fall, could bring IT managers what they thought they were getting when they first bought SANs — the ability to share data across devices, platforms and networks. ▸ 48

SECURITY JOURNAL

Security manager Jude reviews the twists and turns in a career path that has led him to a top security management position in a multinational company and reveals what he looks for in security staffers. ▸ 50

EXEC TECH

Three pounds and smaller than your laptop: Compaq has built the amazing shrinking PC projector. Its small size and not-so-small price — $4,999 — may get your attention, but the MP 2800 portable projector will keep your interest with its high resolution, bright image, decent sound and multimedia module, says reviews editor Russell Kay. ▸ 52

FUTURE WATCH

Magnetic random-access memory (MRAM) promises "instant-on" computers and mobile devices that consume significantly less power than today's models. In the process, MRAM could replace DRAM as the standard memory on computers in less than five years, say analysts. ▸ 53

FOCUS ON CUSTOMER CARE

Online retailers know that it's not the number of hits on their Web sites but the number of sales they make that matters. Companies are turning to text chat, intelligent FAQs, integrated call centers and voice over IP to help answer customers' questions and close those sales. ▸ 58

QUICKSTUDY

Most companies use relational databases to store their important information. Learn how these databases work in this week's primer. ▸ 60

EMERGING COMPANIES

Netegrity may be an emerging company, but it's already leading the pack in providing a single-point tool to control authentication and access to Web portals. The firm now looks to consolidate its position as the competition heats up. ▸ 62

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"XML IS GOING TO replace EDI," says Stephen Bell, chairman of SupplySolution, but others aren't so sure.

EDI OR XML? SOME PICK BOTH

FOR YEARS, ENTERPRISES have relied on traditional electronic data interchange (EDI) to simplify and speed up their business transactions with customers, suppliers and other partners. Now along comes XML, with the potential to reach new markets, simplify access and populate Web pages. Should companies stay with EDI or move to XML? Many are finding they can use both, with the right tools.

54

BRIEFS

NASA, eTrue in Deal

NASA and Southboro, Mass.-based eTrue Inc. signed a contract that calls for eTrue to provide an Internet-based biometric log-on service for NASA employees. The service will authenticate users for both Web and local network log-ons using biometrics such as face and fingerprint verification. The new service will let NASA employees access secure data on network servers from their homes, according to eTrue.

Linux Certification Centers to Open

Linux Centers USA in Jeffersonville, N.Y., announced the opening of 12 centers to prepare candidates for Linux+ and Red Hat certification tests. The company plans to use teaching space in Learn training centers. New York-based Learn has training centers in Atlanta, Boston, Chicago, Dallas, Los Angeles, San Francisco, San Jose, Washington, and Tampa, Fla.

Find Out Whether to Weather the Storm

When the weather outside is frightful, AccuWeather Inc.'s Cancellations.com lists events that were canceled due to weather. Users of the State College, Pa.-based weather forecaster's free service, which was announced last week, can type in their ZIP codes to generate lists of local cancellations.

BakBone Upgrades NetVault Software

BakBone Software Inc. has announced an upgrade to its NetVault software for tape-based data restores and backups running on IBM Ultrium LTO tape drives. San Diego-based BakBone said test results in its interoperability lab showed its software backed up data with 2.5 to 1 compression from a 700 file at a rate of 1BM byte/sec., restoring it at a rate of 20.7M byte/sec., or about 2G byte/min. The restore rate uses 99% of the Ultrium drive's maximum uncompressed throughput rate of 15M byte/sec., said IBM. Pricing for the enterprise version of NetVault starts at $1,995.

DEBORAH RADCLIFF/HACK OF THE MONTH

Stop the Spammers

A FEW WEEKS BACK, one of *Computerworld*'s marketing guys opened an HTML e-mail attachment sent from Lisa@computerworld.com under the subject line, "Answer to your question."

Next thing he knew, he was staring at a blue screen of porn that pushed his tool bars out of sight. While he struggled to get the image off his screen, he heard the clicking of his boss's high heels approaching ever closer to his cube.

"I finally got out of the screen by hitting my cootrol-alt-delete keys," he told me a week later at our Christmas luncheon. "Just in time to save my job."



DEBORAH RADCLIFF is a *Computerworld* feature writer. Contact her at deborah_radcliff@computerworld.com.

Devastating? No. But the help desk got more than a dozen calls about the annoying e-mail. And "Lisa" was enough of a hassle to interrupt user productivity and send *Computerworld*'s trusty IT director Ray Gagnoo on an IP backtracking chase that landed him at the cyberdoorstep of Brinkster.com, an application service provider in Jersey City, N.J.

Anyone can spoof an address and make it look as though messages are coming from inside an organization, Gagnon says.

It can be as simple as changing an Outlook address to masquerade an extension from, say, Yahoo.com to Computerworld.com.

But the real pity is when companies like Brinkster.com unwittingly spread these spams because they didn't take simple steps to secure their mail servers wheo they took them out of the box. In this case, Brinkster allowed blind relay functions to operate.

"The best way to block servers from being used as a relay for spam is to disallow relay on your mail server," says Gagnon. "That way, if someone made a connection with our mail server and said 'I want you to go to Yahoo. com,' the mail server would respond, 'I'm oot relaying to Yahoo.com,' aod drop the connection."

According to Michael Daeo, a technical support staffer at Brinkster, the Lisa spammer did use Brinkster's mail server first to relay a Lisa@brinkster.com spam to its internal mail users, then set Brinkster's mail server up as a relay to spam *Computerworld* and others.

"We're shutting the relay off now," he said, two weeks after slamming *Computerworld*'s mail servers with the spam.

While turning off the relay may stop your organization from being used as an unwitting spreader of spam (or relay-spread viruses), it won't keep inbound spoofed mail from getting to internal employees the way Lisa got to us. That's because it's so easy to target a mail domain like "somebody" or "anybody" at *Computerworld.com*. All it takes is a simple query at the company's domain name service (DNS) to get the mail exchange record (called an MX record), which lists these "all" addresses.

The role of an MX record inside a DNS server is that of a Message Transfer Agent (MTA), which answers the question of "Where do I send this mail?"

Most spoofed mail inbound from relay sites like Brinkster can be effectively blocked by setting up the MTA to first search forward and reverse name service lookups before transferring any mail. This verifies whether these messages are really coming from where they say they are.

Spoofed mail won't pass this test because the domain name or the IP number won't match exactly tbe IP address or name it says it is.

If you'd like more informatioo oo tightening down your mail server, visit *www.sendmail. org.*

Tools to Unlock SAN Promise

BY SAMI LAIS

Software tools, such as three released last fall, could bring IT managers closer to the data sharing they thought they were getting when they first bought storage-area networks (SAN), analysts say.

"People thought when they got a SAN, they'd be getting the ability to share data," said Michael Karp, an analyst at Hurwitz Group Inc. in Framingham, Mass. "And it's true, but they need management tools for that sharing to happen."

SAN resource management starts with knowing what components you have — a process that should be automated, said Stephen Widen, an analyst at IDC in Framingham, Mass.

BMC Software Inc. in Houston; Computer Associates International Inc. in Islandia, N.Y.; and IBM's Tivoli Systems Inc. in Austin, Texas, all claim that their new tools (see chart) offer varying degrees of "autodiscovery" capabilities.

"Autodiscovery in theory does the same thing that Windows 98 does on your machine at home," Karp said. "Plug in some new equipment, and [your system] automatically sees it and understands how to manage it."

But "most people I know [who have SANs] are still working to put together and monitor all the pieces of the infrastructure," said Kevin Turkovich, enterprise systems manager at utilities conglomerate DQE Inc. in Moon Township, Pa.

The promise of SANs runs far ahead of what users should expect today, Turkovich said. "I have yet to see anyone start from ... a SAN and go straight to application-level management," he said. "You have to crawl before you walk, and there's still some crawling to he done to get to interoperability and management at the component level."

"Underlying the success [of the SAN concept] is the key assumption that standards will be developed," he said.

In an IDC survey last year, more than half of IT managers responding said they were considering purchasing a SAN. But 80% said open standards are critical for any SAN implementation they would consider.

"We're still a long way off from having universal standards in SANs," Widen said. However, he added that SANs are following a path "similar to what happened in the LAN environment."

New SAN Tools

BMC Software
Storage modules and application modules available now
PRICE: Modules from $500

Tivoli Systems
Available now; integrates with Tivoli SANergy 2.2 tool set
PRICE: From $3,400 for Intel-based systems, $6,800 for Unix versions

Computer Associates
Framework for the company's ArcServIT storage software expands SAN management
PRICE: Free with ArcServIT



MILES DAVIS
Jazz Pioneer

What do YOU do best?

How to Break Into The Field of Security

Cut out for a security career? Here's how Jude made the leap — and what you will need to succeed



Security Manager's Journal

THIS COLUMN is supposed to be about the trials and tribulations of my day-to-day job, but I get so many questions from people asking how to get into security in the first place that this week, I'm going to tell you how I got here.

I'm one of the few security people I know who have never done anything else. Most people seem to end up in security through engineering, system administration or IT audit roles, or they come in straight at the management level and build on management skills rather than specialist security skills.

I became interested in security during my first year in college, when I came across Unix systems for the first time. Compared with the PCs I'd been using up to then, the Unix systems I worked with were much more powerful. They were also the first shared systems I'd ever used. I quickly found that there were limits set on our privileges, and being an inquisitive sort, I set out to find what those limits were — and to break them.

For a couple of years, I thought that this sort of thing was just a fun way of mucking about with computers and that nothing productive could come of it. When I landed an internship working on a secure system implementatioo for the government, I found that I was wrong on both counts: Something productive could come of security — a good salary — and security quickly stops being fun in the real world when you're confronted with Byzantine rules and regulations.

I graduated with a business degree and a good user's knowledge of computers but very limited technical experience. There was only one obvious route: consulting. I joined a big audit and consulting company that quickly taught me how to act professionally, be nice to the customer, write well and wear sharp suits. It also taught me a bit about security. Luckily, the firm's technical training program was extremely good.

From coosulting, I became a security analyst, working at one company to find security problems and ways to fix them. From the analyst job, I was promoted to security manager, managing the whole process of security, from analysis to sales.

Promotions in security are generally quite easy to come by — just stand around looking competent, and let people know that you know a little about security. There's rarely mucb competition.

Unlike me, many people I've met seem to drift io-to security. One previous manager happened to be the on-call engineer one Saturday wheo manage-meot discovered a computer fraud in progress. He spent the next I0 years trying to stop it from happeoing again. Another moved into security management because the auditors insisted that a security manager be appointed, and he was the ooe person with management experience. Others have takeo the technical route, showing proficiency with one security tool (often firewalls, antivirus software or cryptography) and rapidly being cross-trained on others.

Getting a Foot in the Door

If you want to get into security as a career, there are quite a few ways in. I'd recommend a security career — it's always interesting work, and you get to deal with almost all aspects of IT, from mainframes to Wireless Application Protocol devices. And demand is high, which means job offers and high salaries are easy to find.

The first thing to do is decide what sort of job you're looking for — technical, consulting or management. It all depends on what suits you best.

Technical positions command good salaries. If you get training in a security tool that's in demand, you'll soon have plenty of companies competing for your services.

The simplest way to a technical security job is to build off your existing experience — if you're an e-mail administrator, start by looking at e-mail security products like Santa Clara, Calif.-based Network Associates Inc.'s PGP. If you're a mainframe engineer, try mainframe security administration products like IBM's Resource Access Control Facility. If you are a network engineer, train on Redwood City, Calif.-based Cbeck Point Software Technologies Ltd.'s FireWall-l.

There are quite a few products that seem to be in demand at the moment. Firewalls are a case in point. Most companies have a firewall, and Check Point has a very large market share. It's also one of the easiest to use, which is more than just a coincidence. Intrusion detection and vulnerability scanning tools like those from Internet Security Systems Inc. in Atlanta and Rockville, Md.-based Axent Technologies Inc. (recently acquired by Cupertino, Calif.-based Symantec Corp.) are just starting to build a high demand.

There's a steady demand for certificate authority or public-key infrastructure (PKI) products — especially Plano, Texas-based Entrust Technologies Inc.'s GetAccess and Microsoft Corp.'s certificate-authority software — and if PKI ever really fulfills its potential, then this demand will increase massively. Cryptography projects, in general, are always difficult to staff because few people know much about cryptography. Read Bruce Schneier's seminal book *Applied Cryptography: Protocols, Algorithms, and Source Code in C*, 2nd Edition (John Wiley & Sons, 1995) and you're halfway there.

Consulting and management are both easy and hard to get into: easy because you doo't need to know any individual areas in great detail and big consultancies often look for potential rather than previous experience, and hard because if you want to do well, you have to know quite a lot about most areas of security. You can get a lot of this information from books — Schneier's *Secrets & Lies: Digital Security in a Networked World* (John Wiley &' Sons, 2000) is a good place to start. But in the long run, you'll do best with a professional qualification, such as a Certified Information Systems Security Professional or Certified Information Systems Auditor certification.

Bring Your Attitude

You can learn security technologies and mechanisms quite easily, but there's a required mind-set that you can't learn no matter how hard you try.

I look for people with a questioning attitude, an attentinn to detail, a strong will and a desire to solve problems. The questioning attitude and attention to detail is absolutely necessary because security staff frequently have to evaluate new systems and situations, and it's often hard to come to grips with these new systems quickly. The only way I've ever found to do it is to keep asking questions, no matter how trivial or stupid they sound, until you understand how something works.

The desire to solve problems is central to security work, as problem-solving forms much of the job. Io theory, security staff should be there at the outset, helping to shape and design new systems. But in practice, that rarely happens. It's much more common to be called in when things go wrong and left to solve problems of other people's creation.

Finally, and most important, aspiring security professionals need a strong will. No matter how much people realize that security Is necessary, at the end of the day, you'll be the person insisting on complex solutions to abstract problems that may never happen, and producing no visible end result.

That makes you a potential obstacle to everyone you talk with, and that takes a stubborn streak a mile wide. ◗

THISWEEK'SGLOSSARY

CISSP: Certified Information Systems Security Professional. This is a technical security certification offered by the International Information Systems Security Certifications Consortium Inc. in Dunedin, Fla.

CISA: Certified Information Systems Auditor. This is a certification offered by the Information Systems Audit and Control Association (ISACA) in Rolling Meadows, Ill.

LINKS:

www.isc2.org: Visit this site for information on the CISSP.

www.isaca.org: Visit this site for information on the CISA.

■ This journal is written by a real security manager, whose name and employer have been disguised for obvious reasons. It's posted weekly at *www.computerworld.com* to help you and our security manager – let's call him Jude Thaddeus – better solve security problems. Contact Jude at jude.t@tycos.com, or click on *Computerworld.com*'s Security Watch community forum to participate in discussion topics.



Does your network keep yc ompany a talking or telepathic?

To triumph in the Internet economy, you need an intelligent network that gives you the agility to connect you and your suppliers seamlessly – so they intuitively respond to your every need as it arises. An intelligent network that has the security and scalability to deliver proven Virtual Private Network solutions. An intelligent network with beyond-a-shadow-of-a-doubt reliability. How can your network become so intelligent? With Cisco. Whether you're building your enterprise network or extending it with Cisco Powered Network (Cisco) services, we can show you how to transform your supply chain management capabilities. Discover all that's possible on the Internet at **cisco.com/go/InternetBusiness**.

CISCO SYSTEMS

EMPOWERING THE INTERNET GENERATION™

A Really Big Screen

Three pounds and smaller than your laptop: The amazing shrinking PC projector. By Russell Kay

A FEW YEARS AGO, I led a project that involved the design, creation and editing of almost 2,000 instructional slides using Microsoft Corp.'s PowerPoint.

That in itself wasn't remarkable, but then the client wanted to print each slide on a color transparency for use in an overhead projector — and two or three sets, at that! I ordered $1,000 worth of transparency material and got started.

I quickly learned that no printer to which I had access could do the job in the time needed. Then, sanity struck. I suggested to the client that it would be both cheaper and easier for the instructor to rent a PC projector and attach his PC to it. This would also eliminate the need to carry or ship 50 pounds of acetate.

At that point, PC projectors were fairly ungainly pieces of equipment, weighing anywhere from 7 to 20 lbs. and costing several thousand dollars. But things have changed in just a few years, and nothing exemplifies that better than Compaq Computer Corp.'s MP2800 portable projector.

It weighs less than 3 lbs. and offers Extended Graphics Array (XGA) resolution (1,024 by 768 pixels), a bright image (guaranteed to exceed 900 lumens), a decent built-in speaker and an 8W amplifier, and a multimedia module that simplifies hooking up the projector to anything from a PC to a (regular or high-definition) television or a DVD player.

Yes, it costs $4,999, but if you're on the road a lot making presentations, the MP2800 is relatively cheap.

This isn't the only small projector on the market, but it's the smallest and the most versatile. It sits upright, thus occupying less desk or table space and simplifying setup. It has a zoom lens, and a multimedia module snaps onto the back of the unit, adding many different input connectors in addition to the basic video connector.

It comes with a nifty remote-control device that gives access to all functions and also has a built-in laser pointer.

Compaq has seen fit not to include an on/off switch, so when you plug the MP2800 in, it automatically warms up the lamp and goes on standby, ready to start projecting at a few seconds' notice. The cooling fan is temperature-controlled and has variable speeds, so it comes on only when it's needed. The machine is very quiet.

Recognizing that projector lamps have a tendency to burn out without warning in the middle of an important presentation, Compaq's engineers enclosed the lamp in a quick-change plastic housing, so there's no need to wait for the old bulb to cool down before replacing it with a spare. You can change the lamp and be back to your presentation in less than a minute (assuming you remembered to bring along a spare lamp).



COMPAQ'S MP2800 occupies just 118 cu. in. of space, standing a mere 10 in. high.



THE MP2800 is well-designed for viewing DVD movies and lets you eliminate image distortion.

Ready to Go

Yes, this is an impressive little machine. But when I look at its industrial design, I'm even more impressed by its carrying case. Projectors are expensive, fragile machines that typically come with bulky (and often extra-cost) cases designed to protect them from the tender mercies of the airlines.

But putting a 3-lb. pro- [illegible] lb. [illegible] sense to [illegible] to travel light. Recognizing that anyone who buys this machine will expect to carry it a lot, Compaq put a lot of thought into its carrying case.

The projector and remote control sit in a cut-to-shape bed of very stiff closed-cell foam, surrounded by a sturdy, semihard shell and zippered covering. The case weighs just 27 oz. when empty.

Things such as cables and adapters are stowed in a heavy-duty mesh-front bag that can be packed separately in your luggage or attached temporarily to the projector case via a slip-over strap and hook-and-loop retainer, thus enabling the entire package to be easily carried with one hand.

Quality Images

I tested this unit with standard PowerPoint slide presentations and other computer-generated images, and it performed with no trouble. Its native resolution is XGA, but it scales down to 800 by 600 pixels and up to 1,280 by 960 pixels.

The projector really came into its own when playing DVD movies. The vertical design makes it easier to aim the lens high for unobstructed viewing, and built-in controls let you eliminate keystoning (projecting a trapezoidal image instead of a rectangular one) and other types of geometric distortion.

I didn't try to assess the unit's ruggedness by dropping it, but Compaq says it passes the same durability tests as its Armada corporate laptops.

The small size of this machine has made me reassess the potential for projection devices. While they're still expensive, I recall that flat-panel desktop monitors were introduced with several-thousand-dollar price tags. Flat panels have come down in price and are beginning to approach mainstream affordability. So it wouldn't surprise me if a few years down the road, the PC projector becomes a viable alternative to the CRT or flat-panel monitor.

Mirror, Mirror on the Chip, This Projector Is Most Hip

The heart of Compaq's tiny projector is Dallas-based Texas Instruments Inc.'s digital light-processing chip, the **XGA Digital Micromirror Device**, aided by image processing software from Tualatin, Ore.-based Pixelworks Inc. This technology employs an array of more than 750,000 individually movable mirrors on a single chip, each of which is adjusted as needed while a three-color wheel rotates past the lamp. The human brain assembles the three successive impressions into a single full-color image that's both brighter and sharper than one an LCD projector can produce.

– *Russell Kay*

The Next Step In RAM Tech

A new kind of random-access memory promises instant-on computers and systems that consume less power. By Jaikumar Vijayan

A NOTE FOR ALL those who have woodered why computers take so long to start up: In five years — possibly less — expect to see "instant-on" systems that come to life the moment you hit the switch and that consume a lot less power than today's systems.

Holding out that promise is a developiog technology called magnetic random-access memory (MRAM) that could eventually replace today's dynamic RAM (DRAM) as the standard memory in computing devices.

Derived from a technology that's already used in storage devices, MRAM is in various stages of developmeot by several big-oame vendors, including IBM, Motorola Ioc., Honeywell International Inc., Hewlett-Packard Co. and Intel Corp.

Driving much of the companies' interest is the potential size of the market opportunity — projected to be approximately $40 billion by 2005, according to Fred Zieber, an analyst at Pathfinder Research Inc. in San Jose.

Gauging Its Potential

"MRAM certainly holds tremendous promise," Zieber says. "There is a way to go before you see MRAM in [commercial systems]." But if the technology shapes up right, he predicts, "it will replace DRAM."

MRAM depends oo magnetic polarity to store data, rather than on electricity like DRAM does, explains Stuart Parkin, a scieotist at IBM's Almaden Research Center in San Jose and a pioneer in MRAM research.

In DRAM, a memory bit is stored as an electrical charge on a capacitor. Because this charge on a DRAM chip constantly leaks, it needs to be supplied with a near-continuous electrical current to refresh the memory. When the power is turned off, DRAM chips lose their data, Parkin says.

In contrast, MRAM bits are stored in thin magnetic layers. Since the memory bits are stored magnetically rather than as charges, the memory is nonvolatile and doesn't need power to retain its data.

The difference is crucial in how computers come to life when they're powered up, analysts say.

In current-generation computers, tbe operating system and all application software are stored on the hard disk. When a computer is powered up, it loads a working copy of the operating system along with any other start-up software to the DRAM, from which the data can be quickly accessed by the microprocessor. This boot-up process can take several minutes.

MRAM devices, on the other hand, retain data without using electricity. Because working copies of the operating system and other applications can be stored on MRAM, it eliminates the need for lengthy boot-up times.

Flash memory — the kind found in digital cameras, for instance — already offers this kind of instant-on capability. But those memory devices are far too slow and degrade too quickly to be of much use in a commercial computing environment, says Parkin.

Another kind of memory available today is static RAM (SRAM), which provides faster access to data than DRAM does. Though it needs power to retain data, it doeso't need it constantly like DRAM does. But SRAM chips are more expensive than DRAM chips and therefore aren't ideal for mass commercial markets, says Parkin.

MRAM devices are considerably cheaper to manufacture thao semicooductor-based DRAM and SRAM techoology. MRAM is also expected to substantially reduce the battery power drain for portable devices because it doesn't need to be constantly refreshed like DRAM does, say analysts.

"You are looking at [mobile] computers that can go days and weeks, and cell phones going perhaps even months oo standby operatioo" with MRAM, says Rick Doherty, an analyst at The Envisioneering Group in Seaford, N.Y.

So essentially, the benefits of MRAM technology include the small size of DRAM, speed and performance comparable to that of SRAM, and the oonvolatility and inexpensiveness associated with flash memory, Parkin says.



STUART PARKIN, a scientist at IBM's Almaden Research Center, is creating magnetic tunnel junctions for MRAM experiments.

MRAM Basics

MRAM devices, just like those with DRAM technology, are solid-state devices with no moving parts.

At its most basic, an MRAM device consists of two layers of magnetic material separated by a thin, nonmagnetic metallic layer through which electrons can tunnel. A set of parallel conducting lines are laid on the top half of this ferromagnetic sandwich.

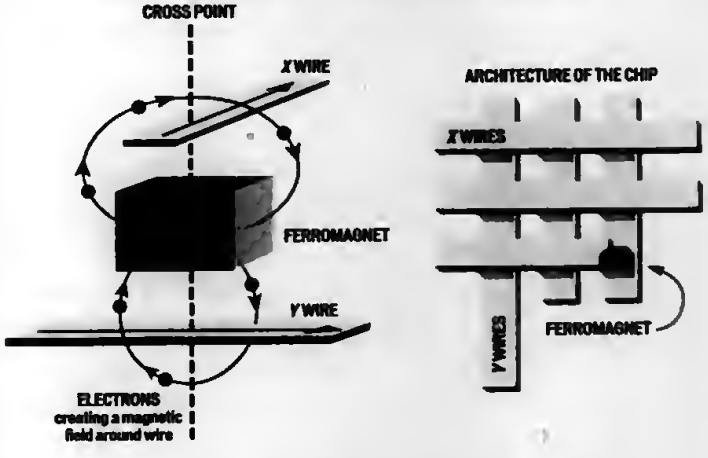
A similar set of conducting lines are laid perpendicularly to the first set on the bottom half of the sandwich, resulting in a grid of conducting lines.

Each point where the bottom and top lines cross represents a bit. Data can be written on or read from such a device by passing currents through wires above and below the device. Once data is entered into the bit, the bit retains the data until the system erases or rewrites it, Parkin explains.

Limited production of such memory devices could begin in high-end systems in about two years, with mass production starting in about five years, predicts Doherty.

What companies are trying to do is "wed the speed of semiconductor memory with the nonvolatility of magnetic materials," Doherty says. "You are talking about the possibility of a unified memory that combines the best of flash, DRAM and SRAM within a single device."

Magnetic Random-Access Memory



An MRAM module consists of a set of parallel magnetic lines overlayed with a nonmagnetic layer, followed by another set of parallel magnetic lines running perpendicularly to the first. Each point where the bottom and top lines cross represents a bit. Data can be written on the chip or read by passing current through the lines.

Enterprises can reach out with XML — if they use the right tools in the right ways

EDI? XML?

FOR YEARS, enterprises have relied on traditional electronic data interchange (EDI) to simplify and speed up their transactions with customers, suppliers and other partners. Now, along comes the document-tagging language XML, with the potential to reach new markets, simplify access, populate Web pages and serve as an Esperanto format for transactions of all kinds. Should companies stay with EDI? Should they move to XML? Should they try to get EDI and XML to interoperate? Many are finding that they can do all of the above — if they use the right tools in the right ways.

Many enterprises embracing both EDI and XML started out in the EDI arena years or decades ago. For instance, St. Louis-based Transentric, which began life as the technology arm of the Union Pacific Corp. rail conglomerate, has been using EDI for more than 20 years. It currently handles more than a million transactions per day with some 8,000 partners on its value-added network (VAN).

Aircast Inc. in Summit, N.J., is another example. The maker of orthopedic braces and other medical products began establishing EDI connections with very large distributors of its products when it was unusual for small businesses to get involved with EDI. Aircast's motivation was simple: To expand the market for its products, it had to adopt the preferred connection method of the larger companies, namely EDI. That investment paid off: Approximately 40% of Aircast's business moves over EDI.

Why XML?

Enterprises have a variety of motivatinns for wanting to get involved with XML. Many are desperate to get involved in e-commerce but have no idea how to get started, given their current technology. In industries that already have online marketplaces and portals springing ioto existence, XML is ofteo the required admissioo ticket. Many firms view the advent of XML as the golden opportunity to automate processes from beginning to end, with the XML format as the central touchstone.

"We have a goal to eliminate manual processes entirely," says Susan McKay, vice president of customer and information systems at Aircast.

For EDI companies, tbe motivations emerge from some of the drawbacks to EDI itself. Most EDI traffic flows over VANs, which can be expensive. The open and free Internet beckons, and while EDI over the Internet is possible, it's not fun. Io contrast, XML is a child of the Internet and seems a more natural format to use. EDI is also primarily a ooe-to-one technology, while Web-based marketplaces allow many-to-one connectivity. "One goal for exploring XML is to broaden our group of trading partners to include those who — for whatever reason — don't use EDI," says Ken Olsen, assistant vice president of marketing at Transentric. In addition, Transentric aims to use its combined EDI and XML prowess to give such increased access to partners as part of its value-added message-management offering.

As with the original adoptioo of EDI, one draw of XML is the fact that your potential business partners may be using it. "Many of our large clients — including automotive and chemical vertical industries — are moving into the growing XML user community," says Randy Morin, director of e-business solutions at Transentric.

Another reason to master EDI/XML interoperability is so you can offer that connection as a service to others. For example, SupplySolution Inc. in Santa Barbara, Calif., aims to calm supply chain nightmares for clieots with its i-Supply service. Many of these clients are struggling with EDI's limitations due to such things as a lack of real-time information and EDI's point-to-point nature. SupplySolution says it doesn't see either EDI or XML as complete answers, but as parts of a package it can offer clients.

CONSIDERATIONS FOR EDI/XML INTEROPERABILITY

- Analyze your current situation thoroughly to identify all the areas that might benefit from EDI/XML interoperability or from XML capabilities. Don't forget back-end integration.
- Use this analysis to create a list of requirements for an ideal XML technology.
- Look for models from existing – or desired – trading partners already using XML.
- Consider third-party sources for EDI/XML expertise that match some or all of your ideal technology.
- Leverage existing hardware and applications.
- Get a small pilot program moving quickly to convince doubters it works and to pinpoint possible problem areas.
- Explore ways to use XML in new areas.
- Parlay XML capabilities into competitive advantages.

What to Look For

If your industry already has a recognized online marketplace to partner with, it's a good idea to follow its lead on tools and technologies. Platform considerations are paramount because you don't want to make massive hardware purchases to support EDI/XML interoperability. Your goal should be to leverage your existing infrastructure investment.

"We're a Windows shop, so Microsoft's BizTalk server technology seemed the ideal solution for our XML needs," says McKay. The low cost of ownership



> **XML is going to replace EDI.**
>
> STEPHEN SELL (LEFT), CHAIRMAN AND FOUNDER, SUPPLYSOLUTION

and ease of use were also important to Aircast.

One alleged advantage of XML is its utility in any-to-any connectivity; it can ensure that a given product will enable you to connect with everyone you need to — or anticipate needing to. There are also different dialects of EDI, and you want to make sure your chosen technology handles them all.

"You don't want 20 different products," says Vicente Manalo, a senior analyst at Aircast. "You want a single product that will talk to everyone."

That said, different products may satisfy different requirements. For example, you might use one component to do EDI mapping and another to translate between XML and EDI. Another consideration here may be integration with existing systems. Investigate whether your current EDI vendor has a tool that simplifies certain tasks with its system before trying to whittle a third-party tool to fit.

It's also advantageous to have data in XML format for supporting e-commerce and portal sites. Pure translation products may be wonderful, but if they can't take it to the Web, they may fall short of your aspirations. If you're looking to do e-commerce, espe-

while keeping their EDI connections
right ways. By Edmund X. DeJesus

? Or Both?

EDI? XML? Or Both?

cially delivering content to Web browsers, make sure that your XML tool can go that extra mile for you.

You clearly need to try before you buy. You can set up some trial projects to get an idea of how — or whether — the product can help you. You can also get an idea of how much integration effort will be necessary if you proceed. For example, Aircast used a beta release of BizTalk for six months.

Fastenal Co. in Winona, Minn., had several hoops that any XML technology would have to jump through. A decade-long EDI user — thanks to the demands of its largest customer — the industrial and construction supplier knew that its existing system couldn't handle XML. Still, Fastenal needed to accept XML transactions to deal with portals and dot-coms. In addition, it wanted to unite its more than 600 branch locations with a common look and feel. And there was that pesky back-end connection. "Seamless integration was of prime importance," says Eric Falls, e-business integration manager at Fastenal.

Luckily, Sterling Commerce Inc. in Dublin, Ohio, had the necessary back-end connectivity and XML capability. Sterling Commerce is mostly known for its traditional Gentran EDI products, but it also offers XML connectivity through some key partners.

This illustrates an important point. Fastenal could have chosen an EDI/XML product and done the heavy lifting of integration from scratch. But by researching its needs more fully, the company was able to frame a better system for its situation. And by carefully investigating vendors, Fastenal discovered a technology set that would meet its needs far better and more simply than a homegrown solution.

Similarly, SupplySolution had a number of priorities for any XML technology. "We operate as a pure [application service provider], so we needed a technology that would support that commitment," says Stephen Bell, chairman and founder of SupplySolution. In addition, since the company tries to smooth transactions for a variety of clients, it needed technology with a variety of maps ready for use. Peregrine Systems Inc. in San Diego filled the bill on these and other counts.

Seek Outside Help

One of the most important points is that it may be necessary to look to outside help when implementing EDI/XML interoperability. "Initially, we tried to build the XML part ourselves," says Bell. "Then we realized that XML is not our business, so we looked to experts for the technology we needed." The same is true for many companies. Sure, you can roll up your sleeves and write it all from scratch. But odds are that you would do better to consult XML experts who do this routinely.

EDI veterans say they often view the addition of XML as déjà vu all over again. Way back when, they had to integrate EDI and its connectivity demands into their existing sales and procurement infrastructure. Now they face a similar challenge with XML.

It's also important to remember that XML is a data format, not a protocol or an application. "You could use XML tags in Cobol if you wanted to," says Fred Domke, chief technology officer at Transentric. The argument is that XML, as a data format, isn't going to buy you much by itself. What matters is the system — including transport, storage and transformation — that you build around it.

For instance, Transentric is using a tool kit from XMLSolutions Corp. in McLean, Va., as part of its EDI/XML and any-to-any processing. But this is only one component. For example, an application may receive a message for processing. That processing may include various stages such as validation and sequencing. One of these stages may involve translation between EDI and XML. Thus, the overall process is a much bigger picture that this translation must fit into.

This is especially true when using EDI/XML transformation as part of an enterprise-class application. Can the tool handle the load? What if the enterprise is offering this connectivity as part of a service? Can the tool scale to manage unpredictable volume? How does the tool behave as part of a system where security, reliability and fail-over require special technologies and strategies?

When building EDI/XML connectivity into an application, you clearly want the component to be portable across any platforms you'll be using. Careful attention must be given to the application programming interface or other hooks for linking with the rest of the system. For instance, Java-based tools have a special appeal for Web-based applications.

One trap that developers might fall into is to think that Web experience will prepare them for EDI-style business-to-business demands. "Web capabilities are far less demanding than enterprise-level B2B," notes Domke. The rock-solid security and reliability of standard EDI connections may prove a more elusive goal in the Web world than many people say.

XML's dark secret is that it's slower than EDI. The messages must be larger — as much as 10 times larger — requiring greater bandwidth and more cycles to move and process. For those merely seeking any-to-any connectivity, this isn't a major barrier. But when you start thinking about handling enterprise-level volumes of transactions, you clearly have to explore the ramifications of moving to XML.

Big Picture

It's important not to limit the scope of what you can accomplish with XML. For instance, Fastenal had a lengthy wish list for its XML connectivity needs, mostly in dealing with its customers. However, "another possible use of XML is for the procurement end of the business," says Falls. Users who can parlay their XML use in one area to solve another set of problems are clearly going to realize an otherwise unexpected return-on-investment windfall.

If you're even contemplating that you may someday want to add XML to existing EDI capabilities, don't wait. In many cases, you can gain a distinct competitive advantage by being first to offer XML connectivity. For example, Aircast was the first medical products provider to do an XML order over the Internet, and it hasn't looked back. Company executives estimate that they have a lead time of at least six months on competitors that may only now be implementing XML technology.

XML Futures

Will XML supplant EDI as the format of choice for electronic transactions? That depends on whom you ask. "XML is going to replace EDI," Bell asserts simply. Certainly there are many people who say they believe — or hope — that's true. They view the current emergence of XML as simply one phase in the inevitable transition.

Others view EDI as coexisting with XML indefinitely, not because they are ignoring the merits of XML, but because they acknowledge the merits and existing base of EDI. "For two companies exchanging a high volume of transactions, you don't need XML — and XML may well impede their connections," says Domke. For well-defined, repetitive and high-volume situations, leaving EDI to do its work makes the most sense for the present. "Especially for large organizations, it makes sense to continue their existing EDI connections," says Falls.

Still others say they see a mixed environment. For instance, XML can be used to make new contacts. If a contact blossoms into a high-volume connection, it might make sense to move to a more dedicated EDI connection.

However, for situations where the relationship isn't well defined, or where interoperability is uncertain, XML is the format of choice. Its flexibility allows transactions to be defined between entities and provides a common format for entities that don't speak the same language. XML doesn't require the hardware, software and IT priesthood necessary to support EDI connections — a burden that smaller companies have always avoided. McKay says an XML-based approach is ideal, especially for small to mid-size companies. Whichever route you take to XML, you can be sure you won't be alone.

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THE OUTSOURCING OPTION

Third-party services can handle EDI/XML interoperability for you.

For some enterprises, bringing EDI/XML interoperability in-house may not make sense. Smaller companies may not want to bother with the effort necessary to support EDI, even with the EDI/XML tools available. Luckily, there are services that can handle your transactions for you, delivering the connectivity and integration you need.

CommerceQuest Inc. in Tampa, Fla., provides one such service. Clients can have a variety of reasons for using this service. They may not have EDI capabilities, but want to do business with a company that mandates EDI. In such a case, CommerceQuest receives the transactions from the client company in whatever format, translates them to EDI and forwards them to the client's partner. The partner sends EDI to CommerceQuest, which translates the EDI into the client's preferred format and forwards it to the client.

Another scenario is where a pure EDI client wants to branch out to non-EDI companies without implementing interoperability in-house. The client sends and receives EDI to CommerceQuest, which does the translation for the non-EDI company. "Either way, this saves companies a lot of effort," says Colin Osborne, chairman of CommerceQuest.

CommerceQuest clients include Global 2,000 companies as well as e-business companies looking to link with business partners. Services like CommerceQuest make it less likely that companies will implement their own EDI capabilities, since that interoperability can be outsourced. At the same time, such services typically use XML exclusively internally and communicate with XML users. Ironically, this EDI/XML interoperability option will probably serve to further reduce the need for EDI in the future.

– Edmund X. DeJesus

Why house

your site in anything

less than a data center

built for broadband?



The Care and Kee
ONLINE CUS

New technologies let online retailers quickly answer customers' questions and make sales. By Mathew Schwartz

POP QUIZ FOR RETAIL WEB SITE MANAGERS: When a customer goes to a site and has a question he can't get answered — "Does your coffeemaker come in white?" — what does that customer do?

Answer: He probably e-mails his question to the site, waits a few minutes and then goes to another site, where he finds what he's looking for and buys the coffeemaker. Case closed. Oh, and eventually an e-mail response from the first company shows up, the delay proving to the consumer that he made the right choice by shopping elsewhere.

Today's Web retailers are increasingly wise to the fickleness of online shoppers. Numerous studies report shopping-cart abandonment rates of 20% to 60% per transaction.

That's why retailers are investing in improved customer-care technologies such as voice over IP, dynamic and searchable lists of frequently asked questions (FAQ) and text chat to get customers the answers they need to buy goods right away.

Retailers are also paying to integrate previously disparate e-mail, phone and chat systems. Integration means shorter response times, which can lead to greater sales.

In the cruise industry, quick responses to potential cruise buyers mean everything. That's because booking a cruise is an impulse buy, says Mike Dauberman, senior vice president of business operations at the Renton, Wash., U.S. headquarters of Vancouver, British Columbia-based Uniglobe.com Inc., a subsidiary of Uniglobe Travel (International) Inc.

"If you can grab a customer while they're on their peak of interest in a cruise, they're considerably more likely to buy it," he says.

That's why Uniglobe tries to respond to every cus-



PHOTOGRAPHS BY BRIAN SMALE

ping of TOMERS

tomer e-mail within 20 minutes and to have phone representatives standing by to answer calls. But in mid-1999, the company was growing quickly, and the 20-minute mark was hard to maintain. With Y2k approaching and Uniglobe's call center nearing the end of its five-year amortization, Dauberman says he wanted an all-in-one call center that would route not just incoming phone calls but also chat and e-mail to all of its agents' desks, one at a time. So now, if an agent doesn't have any phone calls in his queue, the software assigns him a text chat or an e-mail.

After looking at offerings from Basking Ridge, N.J.-based Avaya Inc. (then part of Lucent Technologies Inc.) and Munich, Germany-based Siemens AG, Uniglobe selected the Lucent/Avaya system, primarily because it was actually shipping — Siemens' version was still in the lab. By October 1999, Uniglobe had a new call center from Avaya. Dauberman says Avaya had the phone system for 110 seats up and running in five days, and no maintenance was needed for the first 12 months. Uniglobe is about to upgrade the call center software and add 50 more seats. The software cost $50,000 to $60,000 and coordinates all phone, e-mail and chat traffic.

Avaya also made hardware recommendations, and "we went overboard," says Dauberman. "They said you could run this thing off a $400 Pentium, but we went and decided to get some fairly sophisticated Web servers." Uniglobe bought six Windows NT Servers to run the phone system. Add networking costs and cable, and the extra equipment cost $30,000 to $40,000, he says. Uniglobe had considered building its own call center software to handle e-mail, phone and chat traffic by contacting the individual suppliers for such capabilities. "It would have been considerably less expensive," says Dauberman — possibly as little as $15,000 — "but it would not have been integrated." And integration was the critical selling point, he says.

Overall, "we wanted to go a little more streamlined," Dauberman says. That meant no mainframes, just lots of wall-mounted smaller boxes that could be daisy-chained together. Although Uniglobe is amortizing the technology over four years, Dauberman says the company might get only three out of it, given the rapid pace of technological change.

Today, Uniglobe aims to staff its call center with people who know how to use Microsoft Outlook. "My call center staff isn't technical. If they can use e-mail, they can use [Avaya's call center]," he says.

Dauberman says the online customer care technology landscape isn't changing for his business.

"I was expecting huge, revolutionary changes to technology that made voice over IP a reality this year," says Dauberman, but, he adds, he hasn't seen it.

The Voice Over IP Option

But some companies are taking the plunge into voice over IP (a way to converse via an Internet connection, even while browsing Web pages). Visitors to the Web site of Allfirst Bank, a subsidiary of Allfirst Financial Inc. in Baltimore, can use their PCs to carry on phone conversations with the bank's salespeople. About 100KB of temporary JavaScript software, downloaded when the user hits a "live talk" link, creates a voice over IP session. But users need a computer equipped with a sound card, a microphone, speakers and a fast modem.

The goal is to make the customer's experience a bit more intimate. "We're trying to humanize what we do. You go back to the brand. Chat was a way of humanizing it, but voice is a heck of a way of humanizing it," says Bill Murray, senior vice president of e-commerce at Allfirst.

Murray says he was drawn to voice over IP because, unlike when they're shopping for CDs or books, people often want to talk over their options before signing up for new bank accounts.

A survey conducted by Stamford, Conn.-based Meta Group Inc. indicates that live customer service can cut shopping-cart abandonment rates by 10% to 45% because company representatives can walk customers through problems or immediately answer questions.

Allfirst evaluated various voice over IP systems and chose software from eStara Inc. in Reston, Va., because of its overall simplicity, says Murray. On the consumer side, there's a very small download and no setup; sales representatives can adjust the microphone until they hear the customer. On the back end, eStara "goes into our [private branch exchange] system, just like any other call, so we didn't have to do anything in our call center to make it work," except put some links onto relevant pages, says Murray.

Customer Self-Service

Anyone who's ever worked in a retail store knows that most of the time and mental energy goes into answering customers' questions. But there's no sales clerk online. Where do customers go to get their various questions answered?

At Web sites Ritzcamera.com and Boatersworld.com, both part of Phobo.com Inc. in Irvine, Calif., customers frequently have technical questions, as well as more mundane ones. Phobo kept answering those same questions via e-mail, eveo though the answers could often be found in an online FAQ. But customers weren't finding the FAQ or chose not to browse through the large, static FAQ page, says Vance Brown, chief customer officer at Phobo.

Phobo wanted a way to more quickly get customers to the information they were looking for, so last June the company started using software from AskIt Systems Inc. in New York. Now when customers click on a link on the site to e-mail Phobo or to look at a FAQ, a dialog box pops up and tells them to ask a question using natural language. AskIt processes the questioo and returns a list of similar, previously asked questions for which it has answers. If a customer sees a question that matches his, then the answer is a click away. If the customer doesn't see the answer, he can still e-mail Phobo.

"In retail, it's the customer's choice. You don't make decisions for them; you let them decide, and [AskIt] lets them decide which route to go," says Brown.

To date, AskIt has cut the daily average of e-mailed questions that Phobo receives from 200 to just 100. (Many of those are questions about specific orders.) Viewing a customer e-mail locks it, so two people won't respond to the same document. When Phobo employees answer a question, they can also mark it "public," which adds the question and answer to the AskIt repository.

Phobo opted to go whole hog and have AskIt host all of its e-mail. To get set up, Brown forwarded all of Phobo's FAQs to AskIt, which translated them and had things up and running in a few days. Phobo paid an installation charge and pays an ongoing monthly fee, both of which Brown declined to quantify. He says AskIt has been very responsive to feature requests. For instance, based on a Phobo request, AskIt implemented reporting tools to show how long it took to open customers' e-mail and the time it took to get a reply out, so Phobo could evaluate the software by using its own call center metrics.

Overall, says Brown, having more immediate and detailed answers for consumers increases the likelihood that they'll complete a purchase — which is, after all, the point of customer care technology.

Relational Databases

BY PETE LOSHIN

EVERYONE KNOWS what a simple database is: Telephone directories, mail-order catalogs and dictionaries are all databases of sorts. Databases can be structured or organized in several different ways: as flat files, as hierarchical or networked structures or as related tables. Of these types, relational databases manage most organizations' data.

A database can be described as a table of data consisting of columns and rows, similar to a spreadsheet. Each row contains a single record; each column contains all the instances for each row of one particular piece of data. For example, a typical telephone directory consists of columns holding telephone numbers, subscriber names and subscriber addresses. Each row consists of a number, name and address. This simple form is called a flat file because of its two-dimensional nature and the fact that all data is stored in a single file.

Ideally, every database has at least one column with a unique identifier, or key. Consider the phone book: There may be many entries for J. Smith, but none of the phone numbers will be duplicated. The phone number serves as the key.

In reality, things aren't quite so simple. Two or more people sharing a phone might want a listing for each name; this causes the phone number to appear in two or more places, resulting in multiple rows with keys that aren't unique.

Data Causes Problems

In the simplest databases, every record is complete in a single row, meaning the phone company would need a separate column for every piece of account information. That would require a separate column for a secondary subscriber, another for a tertiary subscriber and so on for as many additional subscribers as might be needed.

This means every record in the database would have to have all the extra columns, even if most would never be used. It also means the database would have to be redesigned and rebuilt every time you rolled out a new service. Add touch-tone service, and you've got to rebuild to add a new column. Add caller ID, call waiting and so on, and you'd have to rebuild again and again.

In the 1960s, only the biggest companies could afford computers to manage their data. Moreover, databases built on static data models and procedural programming languages such as Cobol could be costly to maintain and weren't always reliable. Procedural languages specify sequences of events that the computer should step through to accomplish tasks. Programming such sequences was difficult, especially if you needed to change the structure of the database or cook up a new kind of report.

DEFINITION

Relational databases allow data to be stored in multiple flat-file tables that are related to one another by shared data fields called keys. Relational databases offer easier access to ad hoc reports (generally via SQL) and improved reliability through a lack of redundancy.

Relational Database Model

A relational database uses multiple tables related to one another by a designated key (here, the PhoneNumber field).



Powerful Relations

E.F. Codd, a researcher at IBM's San Jose research laboratory, essentially created and defined the relational database concept in his seminal work "A Relational Model of Data for Large Shared Data Banks" (*Communications of the ACM*, June 1970).

Codd created a model that allowed designers to break down their databases into separate but related tables that made sense for performance while retaining the outward appearance of the original database to end users. Codd has since been considered the father of the relational database.

It works in the following manner: The phone company could build its primary table around a primary key such as telephone number and store it with other basic customer information. The company can define a separate table with columns for that primary key and for value-added services like caller ID and call waiting. It could define yet another table to track billing, with the primary-key phone numbers and billing data in each row (see illustration).

End users can easily extract the information they want in the form they want it, though it's stored in separate tables. So a phone company customer service representative can retrieve a subscriber's billing information as well as the status of special services or the latest payment received, all on the same screen.

Codd originally specified 12 rules for relational databases, most of which address aspects of data integrity, updates and access, though the first two are quite accessible even to a nontechnical audience.

Rule 1, the information rule, mandates that all information in a relational database be represented as a set of values stored in tables; Rule 2, the guaranteed access rule, mandates that every piece of data in a relational database be accessible by table name, primary key and column name. In other words, all data is stored in tables, and if you know the table, the primary key and the column name of the piece of data you want, you should always be able to retrieve it.

One of the implications of Codd's work is that relational databases use declarative rather than procedural programming languages. Declarative languages such as SQL permit users to, in effect, tell the computer, "I want the following bits of data from all records that fit this set of criteria." The computer then figures out the steps it needs to go through to pull that data from the database.

The vast majority of heavy-duty databases rely on relational database management system software available from vendors such as Oracle Corp., Sybase Inc., IBM and Microsoft Corp.

While most vendors' SQL flavors are interoperable only to a point, SQL makes possible the database-backed Web sites that we increasingly rely on. Easy-to-program interfaces between Web sites and relational databases make it possible for end users to add new records, update existing records and produce reports for diverse services such as conducting online trading and accessing online library catalogs.

Loshin is a freelance writer in Arlington, Mass. Contact him at pete@loshin.com.

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Sorry, Only Authentic Users Need Apply

Netegrity is taking lead in market for authenticating user access to Web portals

BY ROBERT L. SCHEIER

OK, YOUR WEB portal strategy has finally caught fire with customers, distributors and suppliers. But how do you handle authentication (ensuring users are who they say they are) and authorization (making sure they get only the appropriate access to applications and data)?

You can build authentication and security logic into each application or into the directories — lists of users or other resources — running on various networks. But this gets unwieldy in a complex, ever-changing portal where thousands of users must have specific access to only certain applications controlled by different businesses.

Enter Netegrity Inc., which several analysts regard as the leader in this small but fast-growing market (Technology, Sept. 11). "We're in the eye of the e-commerce build-out hurricane," says founder, Chairman and CEO Barry Bycoff. For the three months ended Sept. 30, the Waltham, Mass.-based firm reported a 361% jump in sales and $911,000 in earnings.

Authorization Enforcer

Netegrity centralizes all the data about who can access what on a rules engine, or policy server, that runs on a Windows NT or Sun Solaris server. The server contains policies that define, based on users' roles, what applications and data they can access and what actions they can perform.

Agents query the policy server. These run on popular Web server operating systems such as Windows NT, Hewlett-Packard Co.'s HP-UX, Apache and IBM's AIX.

The agents intercept user requests to determine if the resources to which they seek access are protected. If a resource is protected, the agent asks the policy server to determine what level of authentication is required for that resource, and then which resources, such as applications, files or individual Web pages, the user may access.

The ability to adjust authentication requirements to the source of the request was key for Guy Fisher, manager of product integration at GE Global Exchange Services in Gaithersburg, Md. Fisher uses Netegrity's SiteMinder to manage access to the extranets he runs for corporate customers.

He says fine-tuned authentication is important because a company might require only a password from a user entering from an internal corporate network but require a token or digital certificate of that same person coming in over the public Internet. "That is a very important aspect of our service, and SiteMinder enables that . . . nicely," says Fisher.

Netegrity officials claim SiteMinder can handle the largest corporate portals because of its native integration with Lightweight Directory Access Protocol (LDAP) directories, eliminating the need to create and synchronize a separate directory within SiteMinder. The company claims that users can also deploy SiteMinder on proxy, or intermediate servers, which makes it easier to scale to very large numbers of users.

Follow the Rules

Jeff Gorman, an independent consultant to a large insurance company in the Northeast, uses SiteMinder to manage access for 300,000 external and 60,000 internal users on 56 Web sites. "All of your rules and policies and configuration is stored not on the SiteMinder policy servers but on an LDAP database," he says. That lets him handle more users by simply setting up another policy server and telling agents on the Web server that it exists.

Gorman says his client has made SiteMinder its "de facto standard for Web single sign-on and security" because it offers a consistent interface and mechanisms to manage access, and it provides a central — and highly configurable — administration point for all his client's Web applications. "It gives us a good degree of load balancing and fail-over" as well, he says.

Netegrity also claims that SiteMinder gives portal managers the ability to delegate access control to business partners, easing a major administrative headache.

It will take all those advantages and more for Netegrity to maintain its lead as competitors are drawn to the market. But for now, says Bycoff, "Netegrity is blessed with having the technical leadership, the market leadership and now the deployment expertise to really leverage our position." ▶

Scheier is a freelance writer in Boylston, Mass.



LARRY LAUFER

"WE'RE IN THE EYE of the e-commerce build-out hurricane," says Barry Bycoff, founder, chairman and CEO.

Netegrity Inc.

Location: 52 Second Ave., Waltham, Mass. 02451

Telephone: (781) 890-1700

Web: *www.netegrity.com*

Niche: Creating secure access to Web portals

Why it's worth watching: It's the leader in the emerging category of portal authentication and authorization tools.

Company officers:
- Barry Bycoff, founder, chairman and CEO
- Bill Bartow, vice president of marketing
- James Rosen, vice president of business development

Milestones:
- July 1996: Company founded; first product ships
- October 1998: Ships SiteMinder
- November 1999: Completes initial public offering (IPO) of stock
- October 2000: Achieves profitability

Employees: 270

Burn money: $220 million: $15 million in private placement, $205 million in IPO.

Products/pricing: SiteMinder pricing starts at $15 per user; Delegated Management Services, which allows administrators to delegate user management, starts at $8 per user.

Customers: Aetna Inc., AMP Inc., Carrier Corp., General Electric Co., Merrill Lynch & Co., Sun Life Financial Services of Canada Inc., RadioShack Corp.

Partners: Art Technology Group Inc., Plumtree Software Inc., VeriSign Inc., Vignette Corp. and Microsoft Corp.

Red flags for IT:
- Can Netegrity manage its explosive growth?
- Will the company be able to hire enough people to fulfill its integration promises?

COMPUTERWORLD emerging companies

[the buzz] STATE OF THE MARKET

First on The Scene

Here's the good news: "Netegrity created the market" for portal access-management tools three years ago and so far has captured about three quarters of all sales with its SiteMinder tool, says Chris Byrnes, an analyst at Meta Group Inc. in La Jolla, Calif.

The bad news: That only amounts to about 400 licenses so far. But Byrnes says demand should explode as customers begin using these tools on legacy applications as well on portals. And eventually, they will use the tools to manage transactions among portals in addition to access to portals.

Netegrity Chairman and CEO Barry Bycoff says Global 2,000 companies alone will spend $15 billion to manage access to their portals. That doesn't count sales to application service providers and others who manage access rights for their customers.

The major competitors to Netegrity include the following companies:

Securant Technologies Inc.

San Francisco
www.securant.com

Securant's ClearTrust SecureControl is designed with a combination of a central rules engine and proxies that give each Web server "a miniature version of that rules engine," says Byrnes.

Version 4.5 of the tool, which became available in November, features native support for Windows 2000 and Java-based application servers.

Tivoli Systems Inc.

Austin, Texas
www.tivoli.com

Tivoli's SecureWay Policy Director "has a pure proxy architecture," says Byrnes. Tivoli officials say Policy Director also supports devices using the Wireless Application Protocol.

Oblix Inc.

Cupertino, Calif.
www.oblix.com

Oblix ("Emerging Companies," July 24) "is the ease-of-use specialist," says Byrnes. "They have the most manageable offering" in NetPoint, which combines an access rules engine into a tool that had formerly been used for systems and network management, he says.

– Robert L. Scheier



IMAGINE

THE WORLD OF GRAHAM AND EVA AT NORTH AMERICA'S FIFTH LARGEST UNIVERSITY A WORLD WHERE STUDENT DATA WAS REALLY UPTIGHT ABOUT MONOLITHIC HR SYSTEMS. A WORLD WHERE THEY GOT THE DATA AND THE SYSTEMS TO TALK TO EACH OTHER IN A FAR OUT 45 DAYS BY INTEGRATING SAP™ R/3 WITH DB2® WITH MINIMAL CUSTOM CODING IMAGINE PEACE BETWEEN YOUR SYSTEMS PEACE FOR YOUR IT STAFF AND PEACE OF MIND FOR YOU DIG?

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Pinch-Hit CIOs

For most companies, hiring a CIO can be an expensive and lengthy process. In the meantime, there's another option: renting one. By Zachary Tobias

With high turnover rates at all ranks in the IT order, it's not uncommon for a company to suddenly find itself without a CIO. And in a labor market as tight as this one, it can sometimes take years for an organization to find just the right replacement.

In the meantime, of course, work must go on. So more and more companies are turning to a new kind of top IT executive — the interim CIO.

In addition to acting as a fill-in when a top technologist has jumped ship, an interim CIO might also be called in to revamp a troubled IT organization or provide long-term strategic planning at minimum cost.

The companies that hire interim CIOs get top-notch IT professionals for a period of months or even years, while avoiding the larger investment of a permanent hire.

And for the interim CIO, the arrangement offers the best of both worlds: the flexibility and diversity of consulting work, plus the rewards that come with close involvement in a company during a longer period of time.

Here's one IT professional who says the role gives her the excitement of constant new challenges and the satisfaction of bringing changes to companies that will long outlive her stay.

Name and title: Diane Daniele, principal
Company: Aligne Inc., a technology management consulting company in Wayne, Pa.
Current engagement: A 14,000-employee hospital in New York (Due to her temporary status, Daniele asked that the hospital not be identified.)
Experience: Daniele joined Aligne about four years ago, when the IT consulting firm recruited her to kick off its outsourcing and strategic planning practices.

During her first engagement as an interim CIO, she spent 18 months in Phoenix at the IT offices of a large direct marketing firm.

Prior to joining Aligne, Daniele was vice president of IT at an insurance company in Philadelphia. She says that like her, most of Aligne's consultants have previously worked in permanent IT positions in the corporate world, which gives them a leg up in understanding the challenges their clients face. "We've been there," she says. "We've lived what they're living."
Responsibilities: Daniele began her stint at the hospital in November, initially to work on an outsourcing deal. Because she was quick to learn the ropes of the health care industry, the hospital, whose CIO had recently left, offered to extend her stay.

One of the first things Daniele did was hire a recruiting firm and set up a search committee to find a permanent CIO to replace her. But in the meantime, the hospital needed more than just a stand-in.

"Many of the companies that hire interim CIOs are looking for improvement in their IT programs," Daniele explains. "You're seen as an opportunity to bring fresh and new ideas to the organization."

One of her tasks was to bridge the gap between the IT team and upper management — a problem that she says keeps many companies from taking full advantage of technology.

For example, upper management executives were finding it difficult to access information on bed availability and discharge schedules — crucial data in the health care industry. So Daniele suggested a simple change: Use executive desktop software so managers can get the information they need more quickly and thereby avoid bottlenecks.
Challenges: Interim CIOs often have to work in unfamiliar industries, says Daniele. So early on, it's important to meet with both upper management and the IT team to get the lay of the land.

"You have to invest the time and effort to understand their business — and to understand the pressures they face — so you can be as supportive and responsive to their needs as possible," Daniele says.

The No. 1 challenge, though, is balancing time between work and family. Daniele says her engagements can take her anywhere in the country. In her previous interim CIO position, for example, she found herself shuttling twice a month between Phoenix and her home in New Jersey.
Rewards: Salaries for interim CIOs vary, says Daniele, ranging anywhere from $100,000 to $400,000 per year. If a company promotes one of its employees to the role of CIO for a limited time, a bonus will often come with the widened responsibilities.

Because Daniele is an employee of Aligne, her salary stays the same, no matter where the engagement is.

In addition to the monetary rewards, Daniele says, she enjoys the challenge of racing to find ways to improve the performance of the IT teams in the companies where she works.

The work has a personal side, too. "I try to help people within the IT organization improve themselves as well — almost like a form of mentoring," she says. "Helping them achieve greater performance while I'm there gives me a real sense of satisfaction."

Tobias is a freelance writer in Santa Cruz, Calif.

AT A GLANCE

Name and job title: Diane Daniele, acting CIO

Company and location: A major hospital in New York

Nature of her work: Daniele leads the company's IT initiatives, works with outsourcing vendors to choose hardware and software and manages the IT team.

How she got the job: Daniele worked on an outsourcing deal at the hospital with Aligne, the IT consulting management firm where she is a principal. The hospital then offered to extend her engagement, since the company's own CIO had recently left.

Skills required: According to Daniele, a combination of IT and business skills are needed for the job. A broad knowledge of Internet technology as well as familiarity with industry-specific software is important. Communication skills are also a must, since an interim CIO must manage an IT team as well as negotiate with upper management for funding for IT initiatives.

Training needed: Most of Daniele's training came on the job, first as a vice president of IT and then as a consultant at Aligne. She says the best interim CIOs have previously held permanent CIO or vice president of IT positions.

Salary potential: Interim CIO salaries can range anywhere from $100,000 to $400,000, says Daniele.

Advice: Daniele says it's key for an interim CIO to get to know a client's industry quickly and build trust early on. "It's important that you're looked at as a member of the team and not just as a contractor," she says.

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Senior Analyst: Analyses large data sets consisting of complex healthcare systems data which consists of various information recovered for a consortium of 50 academic health centers to provide complex statistical and data reports for use internally and by various health center members. Assists in the planning, developing, and implementing of strategic managed care initiatives for academic health centers. Develops extensive health care data bases and performs managed care/financial analyses central to original research and related managed care projects for academic health center members. Requires Master's Degree in Business Administration or Healthcare or Economics. Education or experience to include completion of one project in the financial analysis of managed care contracts. Hours: 8:00 a.m.-5:00 p.m. 40 Hours per week at $48,970.00 per year salary. Applicants must show proof of legal authority to work in the U.S. Job location Oak Brook, Illinois. Please send two copies of resume and cover letter to: Illinois Department of Employment Security, 401 S. State Street - 7 North, Chicago, IL 60605. Attention: Leonard Bekus, Reference #V-IL 24480-B AN EMPLOYER PAID AD. NO CALLS.

Data Acquisition Analyst
Broomfield, CO

Duties. Develop code/test & maintain software applications to get data from source systems to the data warehouse. Use Bourne Shell & korn shell to help control productions environment & set up & execute new environments. Use Clear Case & Clear tool to maintain code & as a code repository. Map data from source systems, restructuring & redefining it as necessary to clarify & maximize its information content. Prepare & implement changes and/or modification to Data Warehouse Data Model using third party data modeling applications, design process flows, & data flow diagram. Use Power Play cubes to perform multidimensional data analysis & as front end access tool to Data Warehouse. Source data from multiple applications by building integrated data streams to acquire source data, transform data into staging areas, & aggregate & summarize the stages data for user access. Responsible for structuring & architecture of Data Warehouse application for optimal access, performance & integration. Also responsible for building new data sets & data structures as required to support business needs, & for managing distribution, replication & archiving of data throughout enterprise. Manage balance of current & future needs in design & content. Requirements. Bachelor's degree, Management Information Systems or Computer Science. Hours & Salary. 8:00 a.m. - 5:00 p.m., M-F. $65,000/yr. APPLY BY RESUME ONLY TO Job Order #CO4684858 Colorado Department of Labor & Employment ATTN: Mr. Jim Shimada, Tower 2, Suite 480, 1515 Arapahoe St. Denver, CO 80202-2117 MUST PROVIDE PROOF OF LEGAL RIGHT TO WORK IN U.S.

Systems Analyst
Broomfield, CO

Duties. Code/test/maintain software applications, enhancements, & fixes requested by internal & external customers. Analyze requirements & make specifications of software programs. Design & implement software modules, integrate & test software codes into the software programs. Maintain software programs; provide customer support. Develop documentation to describe logic, coding, & modifications. Monitor performance of programs after implementation. Operating systems used include Unix, Windows 95, Windows NT, DOS, MAC OS. Programming languages used are C, C++, Java, Pascal, Fortran, LISP, Assembly, AWK, SQL (Structured Query Language) & SQR. Software products & systems used are database systems, Autodesk & Adobe computer graphics products, Multimedia & presentation software & Authoring systems. Requirements. Bachelor's degree, Computer Science or Management Information Systems. Hours & Salary. 8:00 a.m. - 5:00 p.m., Mon-Fri. $48,000/yr. APPLY BY RESUME ONLY TO Job Order #CO4684857, Colorado Department of Labor & Employment, ATTN: Mr. Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117. MUST PROVIDE PROOF OF LEGAL RIGHT TO WORK IN U.S.

SENIOR TEAM LEADER - Amdocs, Inc., a world leader in software for the telecommunications industry is seeking a Senior Team Leader for its San Francisco office to develop, design & customize proprietary software for electronic information systems. Req. Bach. Deg. in Comp. Sci., Math, Eng'g or a related discipline and exp w/C, COBOL, Oracle and Windows. Send resume to Amdocs, Inc., Box CA1, 1390 Timberlake Manor Pkwy, Chesterfield, MO 63017 Att: K. Madsen

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Computer Design Testing Engineer for Ontario, CA configuring facility of large E-Commerce seller of computers & components. BS or equiv in EE or related required. Reqs for printed circuit board (PCB) design & testing; testing & burning ROMs; integration into PC & uploading software; integrated circuits; setup and configuration for network (LAN/WAN) & internet apps; interface with ISA Bus. Requires prior experience with PCB design & testing, strong working knowledge of PROTEL software, UNIX/LINUX, Electronic Workbench software, techniques of integrated Circuits & components, working knowl of MATHEMATICA. Respond to VP, HR, En Pointe Technologies Inc, 100 N. Sepulveda Blvd, 19th Fl, El Segundo, CA 90245 FAX (310) 725-5237

Senior Software Engineer. Design & implement object oriented system including flexible architecture & reuse ability & database. Implement server - side Java code. Req: master degree in Computer Science, Engineering or Electrical Eng. 40- hrs wk. Job/interview site: LA, CA. Please send resume to: World Class 3530 Motor Avenue, LA, CA 90034

SAP Developer Research, document and code SAP software applications; maintain and develop enhancements to current applications; troubleshoot production application problems; assist with user training. B.S. degree in computer science, engineering, MIS or related field and five years progressive post graduate experience in the position offered or as a programmer/analyst. Or equivalent combination of education and experience. Experience must include use of ABAP SQL, Visual Basic, and C++ programming languages and SAP software. Contact Greg Determore, Hirsh Industries Inc., 1500 Delaware, Des Moines, IA 50317

Manager-Computer Operations sought by co. involved promotional marketing consumer education and product sampling coordination, e-commerce, located in Chatsworth, CA. Must have Masters Degree in Information Systems or Comp. Science & 2yrs. exp. directing & coordination activities of workers engaged in global computer operations for sales over Internet. Send resume to: Director of H.R. (REF: SRL) Promoworks, Inc., 10500 Norwalk Hill Drive, Chatsworth, CA 91311

Software Engineer - XML/VB/COM BS or equiv in any Computer/Engineering field; +min 1 yr experience as Software Engineer or Programmer-Analyst. Design, build, create, implement, maintain & modify all aspects of Internet & Intranet B2B E-Commerce applications/integrate w/ SAP R/3 at back end. Must be fluent in XML, VBCOM, JAVA, JAVASCRIPT, ASP, VBSCRIPT, DHTML, HTML, C, Visual C++, SQL, MS SQL Server, SAP R/3, DCOM, MS Access. Web-based development tools. Respond to Employee Relations Mgr, Supply Access, Inc. 300 N Continental Blvd., Ste 200, El Segundo, CA 90245, FAX (310) 426-4365

Research Engineer for manufacturer in NE Ohio. Serves as a technical leader in the field of machinery diagnostics, computer algorithms, intelligent systems, and sensors. Researches and evaluates new and emerging technologies. Participates in project planning and development. Conducts research development and proof-of-concept implementation for individual projects. Engages in systems development, including hardware, software, and firmware. Develops and tests optical sensor array signal processing by neural networks. Establishes project objectives. Executes and/or coordinates all phases of assigned projects. Provides periodic communications which include status, problems, and opportunities covering update status reports, formal technical reports, computer presentations, and support for research proposals. Required is a Ph.D. in Computer Science or Computer Engineering and one (1) year of experience in the position being offered (i.e., Research Engineer) or one (1) year of experience as a Software Engineer. As part of the required experience in the position being offered or in the related occupation, the applicant must have had experience in sensor development, including developing and testing optical sensor array signal processing by neural networks; had experience with artificial neural networks, including neural network signal processing and image processing; and had experience with image acquisition hardware and software and optical sensing techniques. Monday through Friday, 8:00 am to 4:45 pm; 40 hours per week, $73,410 annually. Qualified applicants may send two (2) resumes and cover letters (no calls) to EE Sp Prgms, REF# 659842, Ohio Bureau of Employment Services, PO Box 1618, Columbus OH 43216.

Director

Candidate's responsibilities will be in the field of new program development for commercial Real Estate. A thorough understanding of real estate financial instruments and fixed income capital markets is required, combined with a BS and 5 years of experience (advanced degree desirable). Candidate will participate in the digitization of related business processes and develop business strategies, financial models and other computer applications required for the operation of these new programs utilizing C, C++, JAVA, and SAS. Specifically a knowledge of mortgage backed securities and commercial real estate lending is necessary as well as a functional understanding of computer applications including data base and networking structures. When applying for the above position, please send resume via email to opportunities@geclosers.com (ASCII text preferred) or mail it to: GE, Suite 42, PO Box 54923, Waltham, MA 02454-9231. Please refer to GECRE:240687:AN000 in the subject line of your email message or on your cover letter. An acknowledgment letter will be sent to confirm receipt of your resume into our electronic database. An Equal Opportunity Employer.

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Baan
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Visual Basic
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Multiple positions exist across the United States. Please mail your resume clearly mentioning the reference number CW1200 to: Attn: Human Resources, ProSoft Technology Group, Inc., 2001 Butterfield Rd, Suite 1050, Downers Grove, IL 60515.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain application software for the manufacturing industry using MS FoxPro, Foxfire and MS Access in a Windows environment. Require: B.S. degree in Computer Science, with 2 years (full- or part-time equivalent) of experience in the job offered or as a Software Consultant. Competitive salary offered. Apply by resume to Kyle Williams, VP of Development, Concord Business Systems, Inc., 1701 Barrett Lakes Boulevard, Suite 160, Kennesaw, GA 30144. Attn: Job YP

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SENIOR SOFTWARE ENGINEER to design, develop, test, implement and maintain application software systems for automation of various business and management processes using Object oriented programming: C, C++, Oracle Developer 2000, SQL and RDBMS in a networked environment. Develop and direct software system testing procedures, programming, and documentation. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or as a Systems Engineer. Extensive travel (50%) on assignment to various client sites within the U.S. if required. Salary: $80,000 per year. 8:00 am to 5:00 pm, M-F. Apply by resume to: Rao Merupudi, Senior Vice President, Power Com Technologies, Inc., 1820 Preston Park Blvd., Suite 1600, Plano, TX 75093. Attn: Job MA

Programmer Analyst, Des Moines, Iowa. Create reports, shell scripts for production on information databases. Design, develop and maintain databases, identify and use requirements and develop user interfaces and develop shell scripts and programs for production. Assist in the analysis and definition of appropriate business requirements. Encode and prepare test data, test and debug programs, write structured, organized and documented, highly maintainable programs.
Develop and maintain computerized batch reports using Developer 2000 on Oracle 8.0. Develop new utilities, and assist with the estimating and scheduling of project tasks and plans. Analyze the requirements for a program and define its overall structure, analyze system program problems and define solutions, and monitor new and emerging technology trends and carry out other computer programming and analytical tasks, as required. Required: Bachelor's degree in Computer Science or Electronics Engineering and at least two years of experience in the job. Salary $49,774.40 per year, 40 hours per week, from 9:00 a.m. to 5:00 p.m. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 215 Watson Powell Jr. Pkwy, Des Moines, IA 50309-1727. Please refer to Job Order 1A#1101163. Employer paid advertisement.

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SOFTWARE ENGINEERS needed for research, analysis, design, testing and implementation of system/software using COBOL, CICS and DB2; to interface systems with Internet using Java, Java Naming and Directory Interface (JNDI) tools together with internet markup languages (HTML and XML) on UNIX and Windows NT. Master's required in Math, Computers, Engineering or an other related field of study, plus 2 yrs exp. Must have proof of legal authority to work in the U.S.

Salary: $70,000/yr for a 40 hour work week.

Interested applicants submit resume or C.V to the Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila., PA 19123. Refer to Job Order #8085604. Ad paid by An Equal Opportunity Employer.

Software Design Engineer- 40 hrs/wk, 8:30 a.m. - 5:00 p.m., M-F, $60,000 per year. Responsibilities include analyze functional requirements for development of computer applications related to electronic medical records and computerized medical test reporting, program database and user interface for computer application related to electronic medical records and computerized medical test reporting. Visual BASIC, C++, SQL, Microsoft Access or SQL server software testing and quality and version control implementation of database security and network architecture. Requirements: Master of Science in Computer Science and one year experience as a Computer Programmer. Experience must include one year in software development. Applicants must show proof of legal authority to work in the U.S. Send resumes to the Illinois Department of Employment Security, 401 South State Street, 7 North, Chicago, Illinois 60605. Attention: Arlene Thrower. Reference # V.IL.244181. AN EMPLOYER PAID AD. NO CALLS. SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

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SOFTWARE ENGINEERS needed for analysis, design, testing and implementation of software using Java, JavaScript, Java utilities and Internet markup languages (HTML and XML) on UNIX and Windows NT; interface systems with mainframe using COBOL, DB2 and CICS. Master's required in Math, Computers, Engineering or any other related field of study, plus 2 yrs. exp. Must have proof of legal authority to work in the U.S.

$70,000/year for a 40 hr work week.

Submit resume or C.V. to The Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila., PA 19123. Refer to Job Order #6032666. Ad paid by an Equal Opportunity Employer.

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SAP Business Analyst, Dubuque. Analyze sales & related business processes & perform client configuration of SAP R/3 Software based on approved analysis. Develop business process scripts to define future business processes & map them to SAP. Perform analyses of 3rd party products integration using SAP. Resp. for managing integration Testing & Customer Acceptance within SAP. SD Module for improving business processes. Develop, design & review training documents, train Sales Distribution clients in SAP. Requires: B.S. (or foreign equiv.) in Bus. Admin., Mktg., Comp. Sci. or related field & 5 mths. exp. in the job offered or 6 mths. exp. as a Mgr. Exp., which may have been obtained concurrently, must incl. 6 mths. exp. designing, developing & reviewing training documents. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary $55,000/yr. Send resume (no calls) to: Carol Majewski, ZF Industries, Inc., 7319 Turfway Rd., Suite 450, Florence, KY 41042.

Intelligence, formerly Schmidt Vogel Consulting, a Global SAP Consulting firm is looking for Consultants with SAP modules, ABAP or Basis exp. for all of our office locations: Atlanta, Chicago, Cincinnati, Cleveland, Dallas, Houston, Minneapolis and Parsippany. Other available positions are: Senior Level Consulting, Proj Man, Consulting Mgrs. and Sales positions, also in all of our locations. Intelligence offers: competitive salaries, 401(k), health benefits, starting three weeks vacation, 12 paid holidays, and many more opportunities. Please submit resume at our website www.intelligence-group.com under Careers of Motion or fax: 913-956-2007 attn: Duane Smith / H.R. Mgr. E.E.O.

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Please forward your resume to

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Software Engineer Design and develop software applications based on client server and distributed component architectures using C++ technology for the middle tier and relational databases for the persistence and HTML, Visual C++, MFC on windows platforms. Demonstrated ability working with C++. Demonstrated ability working with GUI development tools such as Visual C++, MFC, Windows. Knowledge working with class libraries such as: Tools.h++, DBtools.h++, $60,000/yr. 40 hr/wk, 9 a.m. - 5 p.m. Must have 2 yrs. exp. and B.S. in Comp. Sci., Eng., or related field/equiv. Send 2 resumes. Case #20004129. Labor Exchange Office, 19 Staniford, 1st fl., Boston, MA 02114.

Multiple openings for Computer Professionals. Candidates must have experience in one or more of the following areas: Unix/Windows NT/Novell Network, LAN/Cisco Routers/Lotus Notes, C/C++/Java, Oracle/Sybase/Informix/SQL Server (Developer/DBAs) Developer 2000, Oracle applications (Financial/Manufacturing/HRMS), Powerbuilder/Visual Basic, Unix/Solaris/HP-Linux Administrators, QA testers, WAN and Sequent Mirus, Raid Systems using Veritas Volume Manager, Telecom/SS7, HTML/Java Script ASP/Cold Fusion/Perl/CGI/Corba, Ventive. Please submit resumes to: DB Concepts, 14 Summer Street, Malden, MA 02148. Fax: 781-324-2335.

SENIOR PROGRAMMER/ANALYST to analyze, design, develop, test, implement, maintain and support web-based application software systems in a client/server environment using Lotus Notes, Java Script, Lotus Script, Notes Pump, DECS, Domino, Domino workflow, OLE and DB2 in a multi-platform environment. Require: B.S. degree in Computer Science/Engineering, or a closely related field with 2 years of experience in the job offered or as a Programmer/Analyst. Salary $73,500 per year, 8:30 am to 5:30 pm, M-F. Apply by resume to: Matt Merriman, Director of Professional Services, Solarwon Holdings, Inc., One Sun Court, Norcross, GA 30092. Attn: Job JG.

PROGRAMMER/ANALYST (Lvons, NH) to analyze, design, develop, test, code, maintain and implement application software using Visual Basic, Visual C++, MS SQL Server, Oracle, MS Access, Sybase, COM/DCOM ActiveX, ADO, OLEDB, ATL and Automation under Windows and UNIX operating systems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered. Salary: $60,500 per year. M-F 8:30 a.m. to 5:30 p.m. Send resume to: Elizabeth Harvey, Asst. VP, MYND Corp., 1 MYND Center, Blythewood, SC 29016. Attn: Job YS

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SENIOR DATABASE ANALYST to analyze, develop, and administer databases to support business, financial and HR/Payroll applications using Oracle HRMS/Financials, Developer 2000 and PL/SQL. Require: Bachelor's degree with 5 years of progressively responsible experience. Send resume to: Diane McHugh, BOSS Corp., 6485 E. Jones Crossing, Suite 404, Duluth, GA 30097. Attn: Job BA



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Unix Systems Administrator - Bachelor's degree in Computer Science, Engineering or related field or 2 years job as Network Engineer, System Administrator or Computer related occupation.

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Systems Analyst. Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer system. Bachelor's degree in computer science, engineering, or math-related and two (2) years experience in job offered required, including in those two (2) years, two (2) years of ORACLE experience. $62,920/year.
Apply with two resumes to North Metro, Job Order # GA 8941790, 2943 North Druid Hills Road, N.E. Atlanta, GA 30329, or the nearest Department of Labor Field Service Office.

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Mon., January 15, 2001	Mon., February 5, 2001	Mon., February 26, 2001	Mon., March 12, 2001
LAX Sheraton Gateway Hotel	Georgia World Congress Center	Phoenix Civic Plaza - Forum	St. Louis Airport Marriott
WASHINGTON, DC	**PHILADELPHIA, PA**	**DETROIT, MI**	**DALLAS, TX**
Mon., January 15, 2001	Mon., February 21, 2001	Tue., March 6, 2001	Tue., March 27, 2001
Hilton Washington	Pennsylvania Convention Center	Hyatt Regency Dearborn	Dallas Convention Center

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Security

dustries was conducted by RHI Consulting Inc. RHI said it didn't probe deeper into the CIOs' answers to determine truthfulness because of its role as a staffing firm, said Frank Goldschmidt, business development director at Menlo Park, Calif.-based RHI's IT division.

"Whether they are running scared or not I couldn't say," said Goldschmidt.

Alan Paller, director of the SANS Institute, a security research organization in Bethesda, Md., said the majority of CIOs who took part in the RHI survey are likely relying on a "buffer of acceptable risk" that they can tolerate.

"Just as credit card companies accept some level of loss as a cost of doing business, so some CIOs are saying, 'If I do a really solid job of protecting my systems, then I can live with the low-level pain that some break-ins cause,' " said Paller.

However, he added, "liability in court is likely to be the next lever that will push those ostriches into a more proactive stance."

Bill Crowell, CEO of Santa Clara, Calif.-based Cylink Corp. and a former director of the National Security Agency, said many CIOs are "very reluctant" to acknowledge that they have problems protecting their networks. They often measure only whether they have substantial losses, not whether they are vulnerable to attack, he added.

"Ironically, the loss picture, either through luck or ignorance, looks pretty good to most of them," said Crowell. "What is not counted in any of their calculations is the loss from downtime, which can be substantial."

MORE ONLINE For stories and resources about security issues, visit our security community. www.computerworld.com/security

John Pescatore, a security analyst at Gartner Group Inc. in Stamford, Conn., said that about 75% of CIOs at Gartner clients believe they currently have the right balance of security and risk.

"In business, it is always a leapfrog game. Building in too much security will often have a larger negative impact on business than will operating with some vulnerabilities," said Pescatore.

Mike Ozburn, former CIO at Nextel Communications Inc., said most CIOs probably first became aware of their vulnerability about two years ago and have since taken steps to improve their security posture. "I'm certain that many have done security audits and taken actions to bolster security in their enterprise environment," he said.

Regarding the RHI survey, Ozburn, now president of Bridgewater Systems Corp. in Kanata, Ontario, said, "If I were still sitting with my CIO hat on, I would probably give you the same answer."

Yet any CIO who thought he was saving face by saying he was quite secure could have that proclamation thrown back in his face, according to one industry professional who declined to comment on the RHI survey but had discussed security previously.

"We . . . don't want to call attention to what we're doing because if you say you are secure, that's a challenge to somebody to attack," said Gene Gorzelnik, a spokesman for the North American Electric Reliability Council in Princeton, N.J.

The Computer Security Institute in San Francisco said that in a survey last year, some 200 companies (74%) reported having lost a collective $266 million due to viruses, insider abuse, sabotage and other incidents. And more than half of the respondents said they didn't report cyberintrusions to law enforcement out of fear of negative publicity or that competitors would use the information for competitive advantage.

The CERT Coordination Center at Carnegie Mellon University in Pittsburgh said some 21,756 incidents were reported in 2000, up from 9,859 in 1999.

Meanwhile, an international report by research firm Datamonitor in London last November said e-security breaches cause more than $15 billion worth of damage worldwide annually. The report was based on research on 250 major companies and consumer data.

Similarly, a survey conducted in 1999 by the American Society for Industrial Security and PricewaterhouseCoopers found that Fortune 1,000 companies lost more than $45 billion from thefts of proprietary information in 1999.

False Security?

Percentage of CIOs who are "very confident" their networks are safe from internal and external security breaches:

Finance	43.8
Professional services	38
Construction	36.9
Transportation	34.2
Manufacturing	32.8
Business services	32.6
Retail	25.9
Wholesale	23.2

SOURCE: SURVEY OF 1,806 CIOs BY RHI CONSULTING INC., MENLO PARK, CALIF.

Continued from page 1

Data

easy, as sales, marketing and service branches step up their fight over the best way to leverage information to produce results. Kinikin suggests that to resolve these CRM data clashes, companies make sure everyone involved gets a reward. For example, if the sales force is sharing their data, they should be able to get special access to it later to help them sell better.

It's also just starting to dawn on companies just how hard it is to define the return on investment for these data-gathering e-mail, call center and Web site CRM applications, said Sarwar Kashmeri, president of Niche Systems Inc., a New York-based consultancy.

A basic CRM implementation can run anywhere from $100,000 for a small firm to millions of dollars for a multinational one, Kashmeri estimated. And figuring out the value of the knowledge generated by these applications is extremely tricky, if it's even possible, he added.

Among those facing the CRM data management dilemma is audio equipment maker Bose Corp. in Framingham, Mass. The firm has been undertaking a multimillion-dollar project to install a set of applications designed to allow Bose's sales, service and marketing channels to share customer data. Siebel Systems Inc. in San Mateo, Calif., and Akibia Inc. in Southboro, Mass., are the software vendors.



KENT MILLER, CIO at Centura Banks: "Everybody gets excellent service, and higher-value customers get better."

Tim Arnold, manager of CRM strategy at Bose, said a company needs to justify each piece of data it collects, since it must pay to acquire, store, analyze and transmit the information through various departments and IT systems. The firm must then make tough decisions about how to use the data. For instance, a company's marketing department might want to use a set of customer data to launch a campaign that's similar to data a salesperson might use to try to close a deal.

This data also enables companies to automatically classify customers according to their profitability, which can tempt businesses to automatically deliver lower levels of service to some groups and subsequently alienate a significant set of customers, said Kashmeri.

Not so, say some corporate executives. "Everybody gets excellent service, and higher-value customers get better," said Kent Miller, CIO at Centura Banks Inc., a Rocky Mount, N.C.-based full-service financial firm with 250 branches.

Centura has been using CRM software from Denver-based Customer Insight Co. (now called NuEdge Systems) and other vendors to gather, analyze and share data through the company's call centers, branch offices and insurance and investment units since the mid-1990s, said Miller. The company is now ramping up its efforts to disseminate data in real time.

Miller said he believes the CRM applications have paid for themselves, partly by letting Centura retain its most profitable customers through a spate of mergers, including its $608.4 million marriage to Raleigh, N.C.-based Triangle Bancorp Inc. last February.

Atlanta-based United Parcel Service of America Inc. takes customer data and studies it for behavioral patterns — not just to sell more effectively but also to advise its customers on how to optimize their operations, said a company spokesman.

Its investment in CRM applications costs UPS millions of dollars per year, but the knowledge gleaned saves UPS and its customers money, said a company spokesman.

$29M	Viruses
$28M	Insider abuse
$27M	Sabotage of data or networks
$8.2M	Denial-of-service attacks
$7M	Hacks by outsiders

SOURCE: COMPUTER SECURITY INSTITUTE, SAN FRANCISCO

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FRANK HAYES/FRANKLY SPEAKING

The *Real* Threat

ON THE FIRST BUSINESS DAY of 2001, venture capitalist Robertson Stephens Inc. downgraded the stocks of a handful of IT-related companies. Within hours, the Nasdaq tumbled. Hey, that'll grab everyone's attention. Also grabbing attention were the oft-quoted comments of Robertson Stephens analyst Dane Lewis: "Recent industry checks indicate IT purchases will fall off sharply in Q1 '01 . . . Reasons cited include macroeconomic issues and reduced threat from failing dot-coms that will slow aggressive IT initiatives at Old Economy companies."

Remember those words. You may be fighting them for months.

Look, never mind that corporate IT budgets are actually up about 8% this year. Budgets may well be cut, especially if the economy screeches to a halt. Slowdowns mean budget cuts — we all know that. If the money isn't there, we don't spend it.

But what's insidious is the idea that the dot-com die-off means a "reduced threat" for corporate IT.

You'll likely hear that from your CEO when the budget-cutting starts. You'll hear it from other departments when they're competing with you for budget dollars. You'll hear it repeated by other analysts and pundits.

Get ready to fight it. Because it's wrong — dangerously wrong.

Dot-coms aren't a serious threat to big companies. Maybe someday they will be, but that's a long way off. This year, the real threat is what it has always been: your direct competitors.

Wal-Mart looks over its shoulder at Target and Kmart, not Bargainclothing.com. Home Depot worries about Lowe's, not Hardware.com. Montgomery Ward went toes-up after being hammered by Sears and specialty superstores, not Furniture.com.

Even those few dot-coms that have made a real impact have been heavier on hype than bottom-line threat. Amazon.com makes Barnes & Noble sit up and take notice, sure. But B&N sold just under $3.5 billion in books last year. Amazon sold $800 million in books. Borders sold $3 billion. Which one is really breathing down B&N's neck?

Dot-coms are sexy. They get the headlines. But you know the real reason those "aggressive IT initiatives" are crucial.

It's because if the guys across the street can use IT to sell more effectively, or close deals faster, or reduce inventory or paperwork or time to market — if they can do that, it comes out of your company's hide.

Unlike dot-com upstarts, your direct competitors won't live fast and die young. They're not burning venture capital — they're making profits, just like you. And if they can use technology to steal a march on you, you could be in deep trouble.

Unlike dot-com upstarts, your direct competitors won't live fast and die young.



That's the real threat. Not the way-New Economy — but the old-fashioned competition.

So what's there to do? Drill that message home — to your CEO, your IT shop and everyone in your organization. IT matters wherever it can make a competitive difference — for your Web store, your outside salespeople, your warehouses and back office and supply chains and credit operations.

When IT's budget is cut, make sure it's on a sound basis — not because some phantasmal dot-com threat is gone, but because truly noncritical projects can go on hold and really unnecessary projects can be spiked.

And if you've been using dot-coms as a bogeyman to get more dollars for your Internet projects, now's the time to repent. Admit it to the boss, your staff and everyone else: You were wrong.

It's not the dot-coms. It never was. The real threat is — still — the competition. ◗

Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

IT BOSSES RIP OUT users' conventional e-mail clients and substitute a Web-based mail system. Trouble is, with the new Web clients, users can read only plain-text e-mail, so unreadable messages pile up. This organization's most prolific senders of now-unreadable messages? The IT bosses, who're still using the system they've banned for users.

ROAD RULES Tech-support pilot fish gets an urgent call from a traveling user who can't access his e-mail. "Can you set up a remote mailbox so I can read mail off-line?" the user asks. "No problem," says the fish. "Just dial into the e-mail server and download your mail." "No can do," says the user. "I'm at a pay phone at a rest stop on the interstate."

MARKETING COMPANY'S IT staff has to change the IP addresses of all its external hosts. To make sure everything goes smoothly, they trigger the changeover on a Saturday, so there's at least 24 hours for domain name servers (DNS) across the Internet to be updated. But Monday morning, calls start coming in from customers whose mail isn't getting through – apparently some DNS servers don't refresh every 24 hours after all. Agitated customer service rep folks go to the IT boss, demanding to know why they weren't warned – and, more important, exactly whose e-mail isn't getting through.

TRY, TRY AGAIN Product manager sends an e-mail with an executable program file attached. He gets an automated reply: "Your e-mail was automatically deleted because it had an attachment that ended with .exe." It's a security thing, IT manager pilot fish explains, to protect against viruses and Trojan horse programs. Sure, I get it, responds the product manager. "But will it go through if I e-mail it again?"

USERS CALL the help desk to complain that it's taking forever to log on to the network, get their e-mail and download files. Pilot fish investigates. Turns out the whole department had gone to a conference and had shut down every system except a laptop with a 33.6K bit/sec. modem. Grumbles the fish, "Guess which machine had become the master browser?"

OK, you got *your* mail. Now it's Sharky's turn: **sharky@computerworld.com**. There's a sharp Shark T-shirt in it for you if your true tale of IT sees print – or if it shows up in the daily feed at *computerworld.com/sharky*.

The 5th Wave



"For further trouble on this subject, I'm going to read Leviticus and go through the menu to Job, chapter 2, verse 6, file J. It reads..."

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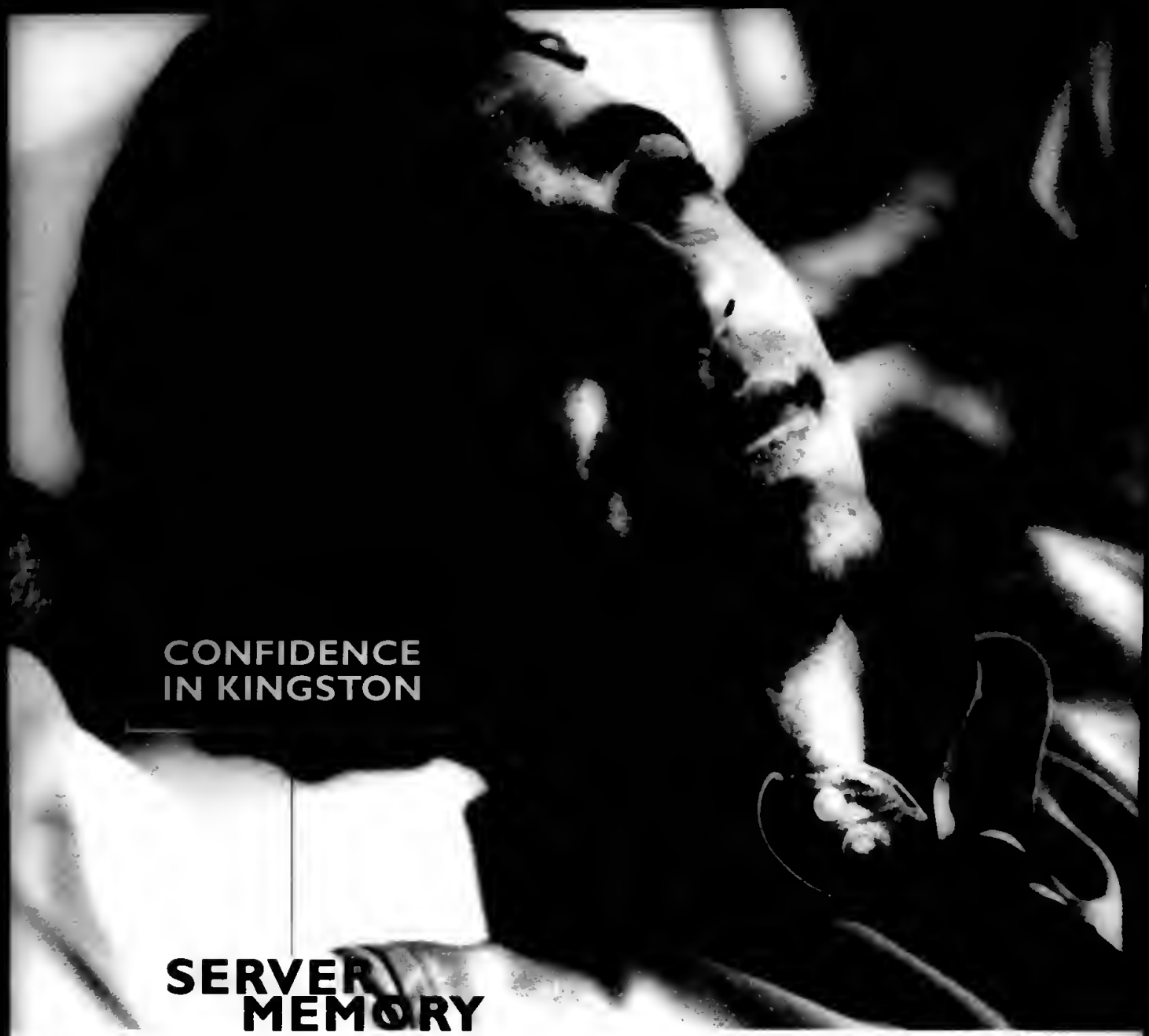


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